## **Analytical Data Package Prepared For**

## **Bechtel Hanford**

Radiochemical Analysis By

## **STL Richland**

2800 G.W. Way, Richland Wa, 99352, (509)-375-3131.

Assigned Laboratory Code: STLRL

Data Package Contains 24 Pages

**Report No.: 21275** 

	SDG No.		Client Sample ID (List Order)	Lot-Sa No.	Work Order	Report DB ID	Batch No.	
(	W03908	B00-030	J008D0	J2K200322-2	FDH591AF	9FDH5910	2325528	







#### CERTIFICATE OF ANALYSIS

Bechtel Hanford, Inc. 3350 George Washington Way Richland, WA 99352

December 27, 2002

Attention: Joan Kessner

#### **AMENDED**

SAF Number : B00-030

Date SDG Closed : November 20, 2002

Number of Samples : Two (2)
Sample Type : Soil
SDG Number : W03908

Data Deliverable : 15-Day / Summary

#### I. Introduction

On November 20, 2002, two soil samples were received at STL Richland (STLR) for radiochemical analysis. Upon receipt, the samples were assigned the following laboratory ID numbers to correspond with the Bechtel Hanford, Inc. (BHI) specific IDs:

STLR ID#	BHI ID#	<u>MATRIX</u>	DATE OF RECEIPT
FDH5L	J008D9	SOIL	11/20/02
FDH59	J008D0	SOIL	11/20/02

## II. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

The requested analyses were:

Alpha Spectroscopy

Americium-241 by method RICH-RC-5072

Plutonium-238, -239/40 by method RICH-RC-5010 Uranium-234, 235 and 238 by method RICH-RC-5079

**Gamma Spectroscopy** 

Gamma Scan by method RICH-RC-5017

**Gas Proportional Counting** 

Total Strontium by method RICH-RC-5006

**Chemical Analyses** 

Chromium Hex by EPA method 7196A



Bechtel Hanford, Inc. December 27, 2002 Page 2

### III. Quality Control

The analytical results for each analysis performed under SDG W03725 include a minimum of one Laboratory Control Sample (LCS), one method (reagent) blank, and one duplicate sample analysis. Any exceptions have been noted in the "Comments" section.

QC and sample results are reported in the same units.

#### IV. Comments

### Alpha Spectroscopy

### Americium-241 by method RICH-RC-5072:

The first analysis batch showed signs of thorium in the alpha spectra. The laboratory contacted the client for direction and the client requested that the data be reported as is. Except as noted, the LCS, batch blank, samples and sample duplicate (J008D0) results are within contractual requirements.

## Plutonium-238, -239/40 by method RICH-RC-5010:

The LCS, batch blank, samples and sample duplicate (J008D0) results are within contractual requirements.

## Uranium-234, 235 and 238 by method RICH-RC-5079:

The LCS, batch blank, samples and sample duplicate (J008D0) results are within contractual requirements.

## Gamma Spectroscopy

## Gamma Scan by method RICH-RC-5017:

The MDA is greater than the CRDL for Co-60, Eu-152, Eu-154 and Eu-155 due to insufficient mass provided. Except as noted, the LCS, batch blank, samples and sample duplicate (J008D0) results are within contractual requirements.

### **Gas Proportional Counting**

## Total Strontium by method RICH-RC-5006:

The LCS, batch blank, samples and sample duplicate (J008D0) results are within contractual requirements.

## **Chemical Analyses**

#### Chromium Hex by EPA method 7196A:

The LCS, batch blank, sample duplicate (J008D9), matrix spike (J008D9), color (J008D9 PbCrO4) spike, and sample results are within contractual requirements.



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I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager, or a designee as verified by the following signature.

Reviewed and approved:

Barbara M. Gillespie

Project Manager

## **Drinking Water Method Cross References**

	DRINKING WAT	ER ASTM METHOD CROSS REFERENCES
Referenced Method	Isotope(s)	STL Richland's SOP number
EPA 901.1	Cs-134, I-131	RICH-RC-5017
EPA 900.0	Alpha & Beta	RICH-RC-5014
EPA 903.1	Ra-226	RICH-RC-5005
EPA 904.0	Ra-228	RICH-RC-5005
EPA 905.0	Sr89/90	RICH-RC-5006
ASTM D2460	Total Radium	RICH-RC-5027
Standard Method 7500-U-C & ASTM D5174	Uranium	RICH-RC-5058
EPA 906.0	Tritium	RICH-RC-5007
NOTE:		
The Gross Alpha LCS is prepared with Am-2		
The Gross Beta LCS is prepared with Sr/Y-9	U (uniess otherwis	e specified in the case narrative)

## **Uncertainty Estimation**

STL Richland has adopted the internationally accepted approach to estimating uncertainties described in "NIST Technical Note 1297, 1994 Edition". The approach, "Law of Propagation of Errors", involves the identification of all variables in an analytical method which are used to derive a result. These variables are related to the analytical result (R) by some functional relationship, R = constants \* f(x,y,z,...). The components (x,y,z) are evaluated to determine their contribution to the overall method uncertainty. The individual component uncertainties  $(u_i)$  are then combined using a statistical model that provides the most probable overall uncertainty value. All component uncertainties are categorized as type A, evaluated by statistical methods, or type B, evaluated by other means. Uncertainties not included in the components, such as sample homogeneity, are combined with the component uncertainty as the square root of the sum-of-the-squares of the individual uncertainties. The uncertainty associated with the derived result is the combined uncertainty  $(u_c)$  multiplied by the coverage factor (1,2, or 3).

When three or more sample replicates are used to derive the analytical result, the type A uncertainty is the standard deviation of the mean value (S/vn), where S is the standard deviation of the derived results. The type B uncertainties are all other random or non-random components that are not included in the standard deviation.

The derivation of the general "Law of Propagation of Errors" equations and specific example are available on request.

Report Definitions

An agreed upon activity level used to trigger some action when the final result is greater than or equal to the Action Action Lev Level. Often the Action Level is related to the Decision Limit. The QC preparation batch number that relates laboratory samples to QC samples that were prepared and analyzed Batch together. Bias Defined by the equation (Result/Expected)-1 as defined by ANSI N13.30. Chain of Custody Number assigned by the Client or STL Richland. COC No Poisson counting statistics of the gross sample count and background. The uncertainty is absolute and in the same Count Error (#s) units as the result. For Liquid Scintillation Counting (LSC) the batch blank count is the background. All known uncertainties associated with the preparation and analysis of the sample are propagated to give a measure Total Uncert (#s) of the uncertainty associated with the result,  $u_r$  the combined uncertainty. The uncertainty is absolute and in the uc\_Combined same units as the result. Uncertainty. (#s), Coverage The coverage factor defines the width of the confidence interval, 1, 2 or 3 standard deviations. Factor Contractual Required Detection Limit as defined in the Client's Statement Of Work or STL Richland "default" CRDL (RL) nominal detection limit. Often referred to the reporting level (RL) Decision Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume Lc associated with the sample. The Type I error probability is approximately 5%. Lc=(1.645 \* Sqrt(2\*(BkgrndCnt/BkgrndCntMin)/SCntMin)) \* (ConvFct/(Eff\*Yld\*Abn\*Vol) \* IngrFct). For LSC methods the batch blank is used as a measure of the background variability. Lc cannot be calculated when the background count is zero. The number assigned by the LIMS software to track samples received on the same day for a given client. The Lot-Sample No sample number is a sequential number assigned to each sample in the Lot. Detection Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume MDC|MDA with a Type I and II error probability of approximately 5%. MDC = (4.65 \* Sqrt((BkgrndCnt/BkgrndCntMin)/SCntMin) + 2.71/SCntMin) \* (ConvFct/(Eff \* Yld \* Abn \* Vol) \* IngrFct). For LSC methods the batch blank is used as a measure of the background variability. **Primary Detector** The instrument identifier associated with the analysis of the sample aliquot. Ratio U-234/U-238 The U-234 result divided by the U-238 result. The U-234/U-238 ratio for natural uranium in NIST SRM 4321C is 1.038. Rst/MDC Ratio of the Result to the MDC. A value greater than 1 may indicate activity above background at a high level of confidence. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result. Rst/TotUcert Ratio of the Result to the Total Uncertainty. If the uncertainty has a coverage factor of 2 a value greater than 1 may indicate activity above background at approximately the 95% level of confidence assuming a two-sided confidence interval. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result. Report DB No Sample Identifier used by the report system. The number is based upon the first five digits of the Work Order Number. The equation Replicate Error Ratio = (S-D)/[sqrt(TPUs<sup>2</sup> + TPUd<sup>2</sup>)] as defined by ICPT BOA where S is the original RER sample result, D is the result of the duplicate, TPUs is the total uncertainty of the original sample and TPUd is the total uncertainty of the duplicate sample. Sample Delivery Group Number assigned by the Client or assigned by STL Richland upon sample receipt. SDG The sum of the reported alpha spec results for tests derived from the same sample excluding duplicate result where Sum Rpt Alpha Spec Rst(s) the results are in the same units. Work Order The LIMS software assign test specific identifier. The recovery of the tracer added to the sample such as Pu-242 used to trace a Pu-239/40 method. Yield

# Sample Results Summary STL Richland STLRL

Date: 27-Dec-02

Ordered by Client Sample ID, Batch No.

**Report No.: 21275** 

**SDG No: W03908** 

Client ID	Work Order Number	Parameter	Result +- Uncertainty ( 2s)	Qual	Units	Yield	MDC MDA	RER
J008D0	FDH591AF	AM-241	2.75E-01 +- 8.6E-02		pCi/g	91.53%	1.28E-02	
J008D0 DUP	FDH591AK	AM-241	1.23E-01 +- 5.0E-02		pCi/g	108.18%	1.15E-02	3.0
Number of Desuites	2							

Number of Results:

RER

# QC Results Summary STL Richland STLRL

Ordered by QC Type, Batch No.

**Report No.: 21275** 

**SDG No.:** W03908

Date: 27-Dec-02

QC Type	Work Order Number	Parameter	Result +- Uncertainty ( 2s)	Qual	Units	Yield	Recovery	Bias	MDCIMDA
BLANK QC	FDMNT1AA	AM-241	9.47E-03 +- 1.3E-02	U	pCi/g	88.10%			1.28E-02
LCS	FDMNT1AC	AM-241	2.93E+00 +- 5.2E-01		pCi/g	132.66%	63.48%	-0.4	1.50E-02

Number of Results:

2

V3.97 A97

#### **SAMPLE RESULTS**

Date: 27-Dec-02

Lab Name:

STL Richland

SDG:

W03908

Collection Date: 11/20/2002 8:30:00 AM

Lot-Sample No.: J2K200322-2

Report No.: 21275 Received Date:

11/20/2002 2:29:00 PM

Client Sample ID: J008D0

COC No.:

B00-030-071

Matrix:

SOIL

										Ordered by Client Sample ID, Batch N					
Parameter	Result	Qual	Count Error ( 2 s)	Total Uncert(2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcer	Analysis, t Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector			
Batch: 2325528	Work Orde	er: FDH	591AF	Report DB II	D: 9FDH5910				<u> </u>						
AM-241	2.75E-01		7.2E-02	8.6E-02	1.28E-02	pCi/g	91.53%	(21.4)	12/18/02 12:01 p		2.0	AMCMISO_EIE_PLT_			
							1.00E+00	(6.4)			G	ALP127			

Number of Results: 1

Date: 27-Dec-02

#### **DUPLICATE RESULTS**

Lab Name:

STL Richland

SDG:

W03908

21275

Collection Date: 11/20/2002 8:30:00 AM

Lot-Sample No.: J2K200322-2

Report No.:

**Received Date:** 

11/20/2002 2:29:00 PM

Client Sample ID: J008D0 DUP

COC No.:

B00-030-071

Matrix:

SOIL

Parameter	Result, Orlg Rst	Qual	Count Error ( 2 s)	Total Uncert(2 s)	MDC   MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcerl	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 2325528 Work Order: FDH591AK Repo				Report DB ID: F	ort DB ID: FDH591KR Orig Sa DB ID: 9FDH5910							
AM-241	1.23E-01		4.6E-02	5.0E-02	1.15E-02	pCi/g	108.18%	(10.7)	12/18/02 12:01 p		1.94	AMCMISO_EIE_PLT_
	2.75E-01	RER	3.0			1.00E+00		(4.9)			G	ALP128
· · · · · · · · · · · · · · · · · · ·					<del></del>					Alnha :	Snac Result	Sum = 1 2F-01

Alpha Spec Result Sum = 1.2E-01

Number of Results: 1

#### **BLANK RESULTS**

Lab Name:

STL Richland

SDG:

W03908

Lot-Sample No.: J2K210000-528

**Report No.:** 21275

Matrix: SOIL

Date: 27-Dec-02

Parameter	Result	Qual	Count Error ( 2 s)	Total Uncert(2 s)	MDC   MD	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcer	Analysis, † Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 2325528	Work Orde	r: FDMI	NT1AA	Report DB ID:	FDMNT1AB		• • •					
AM-241	9.47E-03	U	1.3E-02	1.3E-02	1.28E-02	pCi/g	88.10%	0.74	12/18/02 12:02 p		2.0	AMCMISO_EIE_PLT_
						1.00E+00		(1.4)			G	ALP129

Number of Results: 1

## **LCS RESULTS**

Lab Name:

STL Richland

SDG:

W03908

Lot-Sample No.: J2K210000-528

**Report No.:** 21275

Matrix: SOIL

Date: 27-Dec-02

Parameter	Result Q	Count ual Error (2s)	•		Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector				
Batch: 2325528	Work Order:	FDMNT1AC	Report Di	ID: FDMNT10	cs							
AM-241	2.93E+00	1.9E-01	5.2E-01	1.50E-02 p	ci/g	132.66%	4.62E+00	4.1E-02	63.48%	12/18/02 12:02 p	2.0	AMCMISO_EIE_PLT_
						Rec Limits:	70.	130.	-0.4		G	ALP130

Number of Results: 1

Comments:

Bias



WRISINI O I I				
Data Review Checkli				
RADIOCHEMISTR	Y			
First Level Review			(1)	•
Lot Number: Jakarra 22			1	
Client ID:		<del></del> _		
Due Date: 18/11/80				
QC Batch Number: 2335528		,		
Method Test Parameter: Sx-Am			<del></del>	
Matrix: Swill				·
SDG Number: [\sum_1350 \forall \]		<del></del>	<del></del>	•
DDG Namber.				
Review Item	Yes_(V)	No (√)	N/A (√)	]
A. COC				]
1. Is the ICOC page complete (includes all applicable analysts, dates,	}	Ì.	1	
SOP numbers and revisions)?				]
B. QC Batch		1		
1. Do the Summary/Detailed Reports include a calculated result for	/	1	İ	
each sample listed on the QC Batch Sheet?				
2. Are the QC appropriate for the analysis included in the batch?	<i>J</i>			1
3. Is the Analytical Batch Worksheets complete (includes, as				
appropriate, volumes, count times, etc.)?	·	<del> </del>	<del></del>	}
4. Does the Worksheets include a Tracer Vial label for each sample?		-		4
C. QC & Samples		ļ		<b>\</b> .
1. Is the blank result, yield and MDA within contract limits?		<del> </del>	<del>-   </del>	4
2. Is the LCS result, yield and MDA within contract limits?		<u> </u>	<del> </del>	4
3. Are the MS/MSD results, yields and MDAs within contract limits?	<del></del>	<del> </del> -	<del></del>	4 .
4. Are the duplicate results, yields and MDAs within contract limits?  5. Are the sample yields and MDAs within contract limits?		<del> </del>	<del></del>	-
D. Raw Data		-	<del>-</del>	{
1. Were results calculated in the correct units?				
2. Were analysis volumes entered correctly?		<u> </u>	<del>                                     </del>	1
3. Were yields entered correctly?		<del>}</del>		1
4. Were spectra reviewed/meet contractual requirements?				1.
5. Were raw counts reviewed for anomalies?		·		1
E. Other		<del> </del>		1
1. Are all Nonconformances included and noted?		ĺ	ļ	1
2. Are all required forms filled out?		<u> </u>		1
3. Was the correct methodology used?				1 .
4. Was transcription checked?	/			1
5. Were all calculations checked at a minimum frequency?	1			1
6. Are worksheet entries complete and correct?	/			]
_				. 1
Comments on any "No" response: Spectoa show	s tu	contani	nation.	No
The in the Am 241 but probably a	small	amount	under	· the
tracer peak, Although not much	117	the hig	her trac	TV
would give a lower than acceptable	C. Sel	Jan 241	Client	contacte
said thry would resample	7414.3			<del></del>
706845			•	

LS-038A, Rev. 9, 8/02

Date: 12-13-0>



## Data Review Checklist RADIOCHEMISTRY Second Level Review

Review Item A. Sample Analysis	Yes (√)	No (√)	N/A (√)
A DAUDDIE AUSTVALS	1 200 (1)	12,0(1)	
I. Are the sample yields within acceptance criteria?	1		
2. Is the sample Minimum Detectable Activity < the Contract	<del></del>		
Detection Limit?	/		1
3. Are the correct isotopes reported?	1		
B. QC Samples	V	<del></del>	
1. Is the Minimum Detectable Activity for the blank result ≤ the			
Contract Detection Limit?			
2. Does the blank result meet the Contract criteria?			
3. Is the blank result < the Contract Detection Limit?			·
4. Is the blank result > the Contract Detection Limit but the sample			. ,
result < the Contract Detection Limit?			V
5. Is the LCS recovery with contract acceptance criteria?			
7. Is the LCS Minimum Detectable Activity ≤ the Contract Detection			
Limit?			
B. Do the MS/MSD results and yields meet acceptance criteria?	1/	<u> </u>	
9. Do the duplicate sample results and yields meet acceptance		Ì	
criteria?			
C. Other		İ	İ
Are all Nonconformances included and noted?		<u> </u>	
2. Are all required forms filled out?			
B. Was the correct methodology used?	<u> </u>		
4. Was transcription checked?		<u> </u>	ļ
5. Were all calculations checked at a minimum frequency?			
6. Were units checked?			<u></u>

# **Clouseau Nonconformance Memo**



NCM #: J06895

NCM Initiated By: Pam Anderson

Date Opened: 12/23/02

Date Closed: N/A

Classification: Anomaly

Status: **QAREVIEW** 

Production Area: Environmental - Sep

Tests: AmIso by ALP

Lot #'s (Sample #'s): J2K200322 (2)

QC Batch: 2325528

Nonconformance: Other (describe in detail)
Subcategory: Other (explanation required)

## **Problem Description / Root Cause**

<u>Name</u>

<u>Date</u>

**Description** 

Pam Anderson

12/23/02 Spectra st

Spectra shows Th contamination. No Th in the Am241 ROI, but there is probably a small amount under the tracer peak. Although not much, the higher tracer would give a lower than acceptable Am 241. Client contacted. They said they would resample.

#### **Corrective Action**

<u>Name</u>

Date

**Corrective Action** 

Pam Anderson

12/23/02

Client notified.

#### Approval History

<u>Name</u>

**Date Approved:** 

**Position** 

Pam Anderson

12/23/02

Group Leader

Date Printed: 12/23/02

Page 1 of 1

# CHAIN OF CUSTODY

																<del></del>	<del></del>	
	Hanford	Inc.	C	HAI	N OF CUST	CODY/S	SAM	PLE	ANAL	<u>YSIS</u>	R	REQUEST	Γ		B00	-030-073	Page 1 of 1	
Collector MT Stankovich	Fah	Iben		pany Co ke Stanl		Telepho 531-7		•		ı		roject Coordi RENT, SJ	nator	Price Co	de	8L	Data Tu	rnaround
Project Designation 100 F Area - Full Pro		~		ling Lo 6-F-6 D	cation eep Zone Verificati	on						AF No. 00-030		Air Qu	ality	, [	21 Days	
Ice Chest No.	ec c	71.063		Logboo -1535-7			CC R11	OA 16F620	00			lethod of Ship Hand Delieve		Vehicle				
Shipped To Severn Trent Incorp	porated, Rich	land	Offsi	te Prop	erty No.	12				_	В	Bill of Lading/	Air Bill N	" NE	<del></del>			
POSSIBLE SAMPLE			•			Ϊ	1				•	7						1
Radioactive T	Te7	0 J00 4	-m/	Preservation		Cool 4C	1	Vone	None	None		ne						
Special Handling	and/or Sto	rage		Ту	pe of Container	aG	┷	P	aG	P	1							
<b>:</b>	_	ا الحَم		No.	of Container(s)	1		1	1	1								
		00/40	_		Volume	60mL	100	00mL	60mL	20m	ıL							
SDG		SAMPLE ANALY	sis 1	2-1	11-02	Chromium Hex - 7196	Sp	em (1) in secial netions.	Strontium- 89,90 – Total Sr,	Activity	Scan	n	-					
W03908 U2K			1K2a	200322					M 102902									
Sample No.	Sample No. Matrix * Samp		Sample Date		Sample Time	Service.						<b>M M M</b>	35 FE 190	<b>影</b> 探测		ALC: U.S.	學學學	* 1800
JOOBD9 FDH	151	SOIL	11.20.	92	-0925	یح	⊥.	χ_	X	χ								
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				T		-												
CHAIN OF POS			Sign/Prin	t Name	es.		1	SPEC	IAL INSTR	UCTIO	NS					1		Matrix *
Relinquished By/Removed Relinquished By/Removed	fahil	Dete/Time /4 2	Received By/Stor Received By/Stor	AR	hineheart L	te/Time / 4 1/20/12 te/Time	+29	(1) G	rmma Spectros	сору {Сез	siun	n-137, Cobalt-60, j	Europium-	152, Europi	ium-l:	54, Europium-1	55}	S=Soil SB=Sediment SC=Solid SI=Sludge W = Water O=Oil
Relinquished By/Removed	d From	Date/Time	Received By/Sto	red In	De	te/Time												A=Air DS=Drum Solide DL=Drum Liquide
Relinquished By/Removed	d From	Date/Time	Received By/Sto	red In	D≡	te/Time												T=Tiese W =Wipe L=Liquid
Relinquished By/Removed	From	Date/Time	Received By/Stor	red In	Du	te/Time												V=Vegetation X=Other
Relinquished By/Removed	i From	Date/Time	Received By/Stor	red In	Del	te/Time			•									
LABORATORY R. SECTION						Tit	lie									De	te/Time	
FINAL SAMPLE DISPOSITION	Disposal Metho	od			<del></del>		-		Dispos	ed By						D	etc/Time	

Bechtel Hanford Inc.			HAIN OF CUST	ODY/	SAMPLE	MPLE ANALYSIS REQUEST B00-030-071 Page 1 of					of 1		
Collector MT Stankovich (Foul!		Comp	any Contact ke Stankovich	Telepho 531-7	one No.	•		Project Coord TRENT, SJ		Price Code	8L	Data Tur	
Project Designation 100 F Area - Full Protocol			ling Location 0-F-35 Verification					SAF No. B00-030		Air Quality	<b>7</b> 🗆	21 ]	Days
Ice Chest No.	01.063	Field EL	Logbook No. -1535-7		COA R10F3520	00		Method of Shi Hand Deliev		t Vehicle			
Shipped To								Bill of Lading	Air Bill N	NA NA			
POSSIBLE SAMPLE HAZAI			<u> </u>	Ť .				•	T				
Determine the GT TAM de 2			Preservation	Cool 4C	None	None	Non						
Special Handling and/or S	torage		Type of Container	aG	P	aG	aG ·						
<b></b>	cool 4		No. of Container(s)	1	1 1000 1	1 (0.7	1	1 20-7	<u> </u>			<del></del>	
	_, _, .		Volume	60mL	1000mL	60mL	60m	L 20mL					
	SAMPLE ANA	LYSIS		Chromium Hex - 7196	See item (1) in Special Instructions.	Isotopic Plutonium; Isotopic Uranium; Americium-24!	Stronti 89,90 Sr;						
Sample No.	Matrix *	Sample Date	Sample Time	- 10 A 3 C 3		T. T. Talak							1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-
J008D0 FDH59	SOIL	11.20.	02 0830	X	X	X	_>	<b>X</b>					
				ļ			ļ		<del> </del>				
					_				ļ		ļ	_	
		<u></u>							<u> </u>				
		<u> </u>		<u>1</u>	<u> </u>	<u> </u>	<u> </u>		<u> </u>				
CHAIN OF POSSESSIC Relinquished By/Removed From Relinquished By/Removed From	Date/Time 14 Date/Time 14 Date/Time	Z 9 Received By/Sto	net Names  ored in Claude 40 D  A. Phinehea  ored in D	ete/Time /	(1) G	TAL INSTR		NS zsium-137, Cobalt-6	0, Europium	n-152, Europium-l	154, Europium-1	55}	Matrix *  S=Soil SB=Sediment SO=Solid SI=Studge W = Water O=Oil
Relinquished By/Removed From	Date/Time	Received By/St	ored In D	ete/Time									A=Air DS=Drum Solida DL=Drum Liquida
Relinquished By/Removed From	Date/Time	Received By/St	ored In D	ete/Time									T=Tinuc W!=Wipe L=Liquid V=Vesetation
Relinquished By/Removed From	Date/Time	Received By/St		etc/Time									X=Other
Relinquished By/Removed From	Date/Time	Received By/St	ored In D	ete/Time									
LABORATORY Received B SECTION	у				Title						D	ate/Time	
FINAL SAMPLE Disposal M DISPOSITION	[ethod					Dispo	nsed By				Ē	ate/Time	

176-6-16

VMS Gamma Spectroscopy Report generated 16-SEP-2002 14:32:11

: DKA100: [GAMMA.SCUSR.ARCHIVE] SMP\_RCF10490\_DET1\_750ML9001360\_7
: J004M1 Project Number : I16-F-6 Configuration Sample ID SAF Number : RCF10490 : B00-029

RFC Number 1.17700E+03 GRAMS

Soil Sample Geometry :

Sample Quantity Sample Type Sample Date 12-SEP-2002 08:20:00 Acquisition date : 16-SEP-2002 14:01:51 : % dead time 4 05:41:51.85 : 0.0% :

Decay time Elapsed live time: 0 00:30:00.00 Elapsed real time: 0 00:30:00.76

Energy cal. time : 14-FEB-2002 16:05:03 Effic. cal. time : 3-APR-2002 13:21:12.

: BEGE 3820 Counting geometry: 750 ml >900<1360 Detector name Peak Sensitivity: 3.00000

Efficiency Type : EMPIRICA Energy tolerance: 2.00000

Combined Activity-MDA Report

#### ---- Identified Nuclides ----

Nuclide		Activity (pCi/GRAM)	Act error	MDA (pci/GRAM)	MDA error	Act/MD
K-40		1.663E+01	2.139E+00 5.157E-02	4.678E-01	4.430E-02	35.543
CO-60 CS-137		2.126E-01 1.927E+00	2.2428-01	5.732E-02 7.257E-02	5.234E-03 7.011E-03	3.709 25.182
EU-152 EU-154		3.183E+00 3.103E-01	2.277E-01 7.589E-02	1.248E-01 9.056E-02	1.468E-02 8.926E-03	25.512 3.426
EU-155	<del>⑤</del>	4:651E-03	7 <del>265E-02-</del>	→1.233E-01	1.353E-02	0.038
TL-208 PB-212		1.541E-01 5.501E-01	8.201E-02 1.003E-01	6.502E-01 9.942E-02	6.318E-02 1.093E-02	0.237 5.533
PB-214 AC-228		5.815E-01 4.299E-01	1.151E-01 3.128E-01	1.200E-01 0.000E+00	1.185E-02 0.000E+00	4.849 0.000
TH-234	9	7:642H-01	5.5155-01	→9.307B-01	3.860E-01	0.821
Ծ-235		8.327E-02	6.568E-02	6.393E-02	6.239E-03	1.303

#### ---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity K.L. (pCi/GRAM) Ideo	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
BI-212	3.943E-01	6.736E-01	1.068E+00	1.155E-01	0.369
BI-214	5.423E-01 +	1.688E-01	2.272E-01	2.319E-02	2.387
RA-226	1.224E+00 +	1.176E+00	1.313E+00	1.179E-01	0.932
AM-241	5,864E-02	7.127E-02	1.239E-01	1.439E-02	0.473
	- N				

3731224 ;

Approval Date: 9 / 17 / 2 Approved by:

## 100F-35

## mma Spectroscopy Report generated 4-NOV-2002 09:45:02

: DKA100: [GAMMA.SCUSR.ARCHIVE] SMP\_RCF10608\_DET1\_50GRAMPILLBOX60 : J00863 Project Number : I00-F-35 Iguration Project Number : J00863 ble ID : B00-029 SAF Number Number : RCF10608

: 6.70000E+01 GRAMS imple Quantity

sample Type : Soil Sample Date

Decay time : 4 00:29:46 Elapsed live time: 0 01:00:00.00 4 00:29:46.65

Energy cal. time : 14-FEB-2002 16:05:03 Effic. cal. time : 4-APR-2002 08:08:29.

: BEGE 3820 Detector name Peak Sensitivity: 3.00000

Efficiency Type : EMPIRICA

Sample Geometry : 31-OCT-2002 08:15:00 Acquisition date : 4-NOV-2002 08:44:46.

% dead time ; 0.0%

Elapsed real time: 0 01:00:00.14

Counting geometry: 50Gram pill box

Approval Date: 11/4/02

Energy tolerance: 2.00000

#### Combined Activity-MDA Report

#### ---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
K-40 CS-137 EU-155 TL-208 BI-212 PB-212 PB-214 AC-228 TH-234 AM-241	1.441E+01 4.730E-01 2.418E-02 2.013E-01 2.124E+00 6.016E-01 6.617B-01 6.474E-01 9.832E-01 4.739E-02	4.216E+00 1.727E-01 7.948B-02 1.688E-01 1.707E+00 1.496E-01 2.491E-01 4.721E-01 5.467E-01	2.890E+00 1.340E-01 1.335E-01 1.970E+00 2.285E+00 2.249E-01 2.636E-01 0.000E+00 7.355E-01 9.839E-02	2.868E-01 1.529E-02 1.561E-02 2.168E-01 2.825E-01 2.585E-02 2.679E-02 0.000E+00 3.098E-01 1.371E-02	4.987 3.531 0.181 0.102 0.929 2.674 2.510 0.000 1.337 0.482

#### -- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pC1/GRAM)	MDA error	Act/MDA
CO-60	2.152E-02		1.298E-01	2.739B-01	2.653E-02	0.079
EU-152	8.745E-02	+	1.357E-01	1.822E-01	2.902E-02	0.480
BU-154	6.377E-02	+	9.889E-02	1.115E-01	1.620E-02	0.572
BI-214	6.201E-01	+	3.218E-01	6.607E-01	7.583B-02	0.939
RA-226	4.734E-01		1.117E+00	2.120E+00	1.892E-01	0.223
บ-235	3.071E-02		6.477E-02	1.232E-01	1.196E~02	0.249
	•	N.	•			

Approved by:

TIMOTHY J. SNIDER



## Sample Check-in List

Date/T	ime Received: 11/00/02@14:27 OF	
Client:	BHI SDG#: W0390	8 na[] saf#: <u>B00-030 n</u> a[]
Work (	Order Number: <u>J2K20032</u> 2, Ch	ain of Custody # <u>B00-030-071,</u> -07
Shippin	ng Container ID: ERC-01-063 Air	Bill # D (A
1.	Custody Seals on shipping container intact?	NA[] Yes [X No[]
2.	Custody Seals dated and signed?	NA[] Yes No[]
3.	Chain of Custody record present?	Yes [X No []
4.	Cooler temperature: 4 NA[] 5.Vern	niculite/packing materials is NA [] Wet [] Dry
6.	Number of samples in shipping container:	
7.	Sample holding times exceeded?	NA Yes [] No []
8.	Samples have:tapecustody seals	hazard labels appropriate samples labels
9.	Samples are:in good conditionbroken	leaking have air bubbles (Only for samples requiring head space)
10.	Sample pH taken?	NA () pH<2[] pH>2[]
11.	Sample Location, Sample Collector Listed? * *For documentation only. No corrective action	Yes [\frac{1}{2} No []
12.	Were any anomalies identified in sample receipt	? Yes [] No []
13.	Description of anomalies (include sample number	ers):
Sample	Custodian: afful Chrestoan / Riche	Date: 11/20/02
Clie	ent Sample ID Analysis Requested	Condition Comments/Action
Client In	oformed onby	Person contacted
[ ] No	action necessary; process as is.	
Project N	Manager	Date
15 023	9/01 Pay 4	

12/6/02 9:35:21 AM		1 700?	Sample Pro	eparation/Ana	alysis		Balance Id:1120373	3922 .
12/6/02 9:35.21 AM 127642, BECHTEL HA Bechtel Hanford, Inc. <b>Report Due: 12/11/2</b>	NFORD, INC. $^{ackslash}$	M03908 61 Pu	ıAm PrpRC5013/RC	C5019, SepRC5080	-		Pipet #:	
Bechtel Hanford, Inc.	<del>√√ 03</del> 8	309 12-60 SX Ar	mericium-241 by Al	pha Spec		PRIOR	DT m Tech:	
			JENT: HANFORD	···		<del> </del>		
Batch: 2325528	SOIL	pCi/g	PM,	Quote: BG1, 27	038	Se	p2 DT/Tm Tech:	
SEQ Batch, Test: 232552	7, 6ISO 2325527,	6ISO					Prep Tech: ,WAGN	IERJ
Work Order, Lot, Sample DateTime	Total Amt/Unit	Initial Afiquot Amt/Unit	QC Tracer Prep Date	QC Vial 2 Prep Date	Count , Time Min	Detector Id	Count On Off (24hr) Circle	CR Analyst, Init/Date
1 FDH59-1-AF		2.0g,in	PATB2612 11/06/02		200			
J2K200322-2-SAMP			09/30/02,					
11/20/2002 08:30		AmtRec: LP,3X60G,2	20ML #Containers: !	5		Scr Rst:	Alpha: 9.47E+00 pCi/g	Beta: 2.39E+01 pCi/g
2 FDH59-1-AK-X	·	1.94g,in	PATB2613			. *		
J2K200322-2-DUP			11/06/02 09/30/02.r		<u></u>			************
11/20/2002 08:30		AmtRec: LP,3X60G,2	20ML #Containers:	5		Scr Rst:	Alpha: 9.47E+00 pCi/g	Beta: 2.39E+01 pCi/g
3 FDMNT-1-AA-B	<u> </u>	2.0g,in	PATB2614	_		•		
J2K210000-528-BLK			11/06/02 09/30/02.r					·
11/20/2002 08:30		AmtRec:	#Containers: 1			Scr Rst:	Alpha:	Beta:
4 FDMNT-1-AC-C		2.0g,in	AMSJ0156		ļ			
J2K210000-528-LCS			11/20/02 09/02/99,r					
11/20/2002 08:30		AmtRec:	#Containers: 1			Scr Rst:	Alpha:	Beta:
5 FDMNT-1-AD-BX		2.03g,in	PATB2615		Ì			
J2K210000-528-MBLK			11/06/02 09/30/02,r					1000
11/20/2002 08:30		AmtRec:	#Containers: 1			Scr Rst:	Alpha:	Beta:
6 FDMNT-1-AE-CM		2.0g,in	AMSJ0155					
J2K210000-528-MLCS			11/20/02 09/02/99.r					
11/20/2002 08:30		AmtRec:	#Containers: 1	<u></u>	<u> </u>	Scr Rst:	Alpha:	Beta:
10								
10								
STL Richland Key:		fi - Final Amt, di - Diluted Am		2 Page 1				WO Cnt: 6 Prep_SamplePrep v4.6
Richland Wa.	r - Reference date	e, ec-Enrichment Cell, ct-Coo	ktailed Added	, ଜନ୍ମତ ।	•			Frep_SampleFrep V4:

1	2/	6/	02	9:3	5:22	AM

## Sample Preparation/Analysis

Balance Id:1120373922

**Prep Tech: WAGNERJ** 

6l PuAm PrpRC5013/RC5019, SepRC5080(5003)/RC5010(5039)

SX Americium-241 by Alpha Spec

**5I CLIENT: HANFORD** 

PRIORITY DT/Tm Tech:

Pipet #: \_

Report Due: 12/11/2002

pCi/q

Sep2 DT/Tm Tech:

SEQ Batch, Test: None

Batch: 2325528

Work Order, Lot, Total Initial Aliquot QC Tracer QC Vial 2 Count Count On | Off Detector CR Analyst, Sample DateTime Amt/Unit Amt/Unit Prep Date Prep Date Time Min ld (24hr) Circle Init/Date

Comments:

Sumples were muffled overnight. 12-06-02 GER.
Ottawa sand used for QC samples #5 FDMNT-1-AD-BX and #6 FDMNT-1-AE-CM. 12-06-02668

127642,	BECHTEL HANFORD	INC.		Bechte:	Hanford, Inc.	•	BG1, 27038				
DH591AF-SA	MP Constituent Li	st:									<del></del> -
Am-241	RDL:1	pCi/g	LCL:70	UCL:130	RPD:35	AM-243	RDL:	pCi/g	LCL:20	UCL:105	RPD:35
FDMNT1AA-BL	LK:										
Am-241	RDL:1	pCi/g	LCL:	UCL:	RPD:	AM-243	RDL:	pCi/g	LCL:20	UCL:105	RPD:35
DMNT1AC-LC	es:										
Am-241	RDL:1	pCi/g	LCL:70	UCL:130	RPD:35	AM-243	RDL:	pCi/g	LCL:20	UCL:105	RPD:35
DMNT1AD-MB	BLK:						,				
Am-241	RDL:1	pCi/g	LCL:	UCL:	RPD:	AM-243	RDL:	pCi/g	LCL:20	UCL:105	RPD:35
DMNT1AE-ML	cs:										
Am-241	RDL:1	pCi/g	LCL:70	UCL:130	RPD:35	AM-243	RDL:	pCi/g	LCL:20	UCL:105	RPD:35
						÷					
	MP Calc Info: : Level (#s).: 2	Decay t	o SaDt: Y	Blk Subt.:	. N Sci.Not	. <b>v</b> on	Rs: B				
DMNT1AA-BL		Decay c	o babe. I	DIR DUDCI.	. A BCZINOC	1	Ka. D				
	Level (#s).: 2	Decay t	o SaDt: Y	Blk Subt.:	: N Sci.Not	. Y OD	Rs: B				
DMNT1AC-LC	* *										
Uncert	Level (#s).: 2	Decay t	o SaDt: Y	Blk Subt.:	N Sci.Not	.: Y OD	Rs: B				
DMNT1AD-MB	· · · · · · · · · · · · · · · · · · ·	-									
Uncert	: Level (#s).: 2	Decay t	o SaDt: Y	Blk Subt.	N Sci.Not	.: Y OD	Rs: B				
DMNT1AE-ML	CS:										
Uncert	: Level (#s).: 2	Decay t	o SaDt: Y	Blk Subt.:	N Sci.Not	.: Y OD	Rs: B				

 $\mathcal{V}_{\mathcal{O}}$ 

STL Richland

Key: In - Initial Amt, fi - Final Amt, di - Diluted Amt, s1 - Sep1, s2 - Sep2

Richland Wa.

r - Reference date, ec-Enrichment Cell, ct-Cocktailed Added

Page 2

WO Cnt: 6 Prep\_SamplePrep v4.6 12/23/02 3:15:10 PM

# ICOC Fraction Transfer/Status Report ByDate: 11/23/02, 12/24/02, Batch: '2325528', User: \*All Order by BatchNbr, WorkOrderNbr, DateTimeAccepting

Batch Work	Ord CurStat	us Ac	cepting		Comments
2325528					
4 <i>C</i>	CalcC	BELSITOB	11/27/02 3:29:	45 PM	
SC		WagarR	IsBatched	11/21/02 3:08:49 PM	ICOC_RADCALC v4.5.3.2
SC .		BELSITOB	InPrep	11/27/02 3:29:45 PM	RICH-RC-5013 REVISION 4
SC .		BELSITOB	InPrep	11/27/02 3:29:57 PM	RICH-RC-5013 REVISION 4
SC .		BELSITOB	Prep1C	12/2/02 2:48:35 PM	RICH-RC-5013 REVISION 4
SC .		BELSITOB	Prep1C	12/2/02 2:48:48 PM	RICH-RC-5013 REVISION 4
SC .		WAGNERJ	InPrep2	12/3/02 9:26:09 AM	RICH-RC-5019 REVISION 2
SC		WAGNERJ	Prep2C	12/6/02 2:36:12 PM	RICH-RC-5019 REVISION 2
SC		HAMMERL	InSep1	12/9/02 8:07:43 AM	RICH-RC-5080 REVISION 1
SC		McPHERONC	InSep2	12/13/02 8:54:05 AM	RICH-RC-5010 REVISION 3
SC .		McPHERONC	InSep2	12/13/02 8:54:36 AM	RICH-RC-5039 REVISION 3
SC .		McPHERONC	Sep2C	12/13/02 8:55:12 AM	RICH-RC-5039 REVISION 3
5 <i>C</i>		BlackCL	InCnt1	12/13/02 10:12:20 AM	RICH-RD-0008 REVISION 2
SC .		DobeckiT	InSep2	12/17/02 12:14:52 PM	RICH-RC-5003 REVISION 4
SC .		DobeckiT	Sep2C	12/17/02 12:15:07 PM	RICH-RC-5003 REVISION 4
SC		BlackCL	InCnt1	12/17/02 12:20:51 PM	RICH-RD-0008 REVISION 2
SC .		BlackCL	CalcC	12/19/02 11:39:26 AM	RICH-RD-0008 REVISION 2
IC .		BELSITOB	11/27/02 3:29:	57 PM	
IC		BELSITOB	12/2/02 2:48:3	5 PM	
IC .		BELSITOB	12/2/02 2:48:4	8 PM	
AC .		WAGNERJ	12/3/02 9:26:0	9 AM	
1C		WAGNERJ	12/6/02 2:36:1	2 PM	
AC		HAMMERL	12/9/02 8:07:4	3 AM	
AC .		McPHERONC	12/13/02 8:54:	05 AM	
AC .		McPHERONC	12/13/02 8:54:	36 AM	
4 <i>C</i>		McPHERONC	12/13/02 8:55:	12 AM	
IC		BlackCL	12/13/02 10:13	2:20	
IC		DobeckiT	12/17/02 12:14	4:52 PM	
AC .		DobeckiT	12/17/02 12:1	5:07 <b>PM</b>	
IC		BlackCL	12/17/02 12:20	D:51 PM	
4 <i>C</i>		BlackCL	12/19/02 11:39	nice	

## **Analytical Data Package Prepared For**

# **Bechtel Hanford**

Radiochemical Analysis By

## **STL Richland**

2800 G.W. Way, Richland Wa, 99352, (509)-375-3131.

Assigned Laboratory Code: STLRL

Data Package Contains 58 Pages

Report No.: 21240

SDG No.	Order No.	Client Sample ID (List Order)	Lot-Sa No.	Work Order	Report DB ID	Batch No.
W03908	B00-030	J008D0	J2K200322-2	FDH591AE	9FDH5910	2325527
		J008D0	J2K200322-2	FDH591AC	9FDH5910	2325529
		J008D0	J2K200322-2	FDH591AH	9FDH5910	2325530
		J008D0	J2K200322-2	FDH591AD	9FDH5910	2325531
		J008D0	J2K200322-2		9FDH5910	2325532
		J008D9	J2K200322-1	FDH5L1AE	9FDH5L10	2325530
		J008D9	J2K200322-1	FDH5L1AC	9FDH5L10	2325531
		J008D9	J2K200322-1		9FDH5L10	2325532



#### CERTIFICATE OF ANALYSIS

Bechtel Hanford, Inc. 3350 George Washington Way Richland, WA 99352

December 20, 2002

Attention: Joan Kessner

SAF Number : B00-030

Date SDG Closed : November 20, 2002

Number of Samples : Two (2)
Sample Type : Soil
SDG Number : W03908

Data Deliverable : 15-Day / Summary

#### I. Introduction

On November 20, 2002, two soil samples were received at STL Richland (STLR) for radiochemical analysis. Upon receipt, the samples were assigned the following laboratory ID numbers to correspond with the Bechtel Hanford, Inc. (BHI) specific IDs:

STLR ID#	BHI ID#	<b>MATRIX</b>	DATE OF RECEIPT
FDH5L	J008D9	SOIL	11/20/02
FDH59	J008D0	SOIL	11/20/02

## II. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

The requested analyses were: Alpha Spectroscopy

Americium-241 by method RICH-RC-5072

Plutonium-238, -239/40 by method RICH-RC-5010 Uranium-234, 235 and 238 by method RICH-RC-5079

Gamma Spectroscopy

Gamma Scan by method RICH-RC-5017

**Gas Proportional Counting** 

Total Strontium by method RICH-RC-5006

**Chemical Analyses** 

Chromium Hex by EPA method 7196A



Bechtel Hanford, Inc. December 20, 2002 Page 2

#### III. Quality Control

The analytical results for each analysis performed under SDG W03725 include a minimum of one Laboratory Control Sample (LCS), one method (reagent) blank, and one duplicate sample analysis. Any exceptions have been noted in the "Comments" section.

QC and sample results are reported in the same units.

#### IV. Comments

#### Alpha Spectroscopy

#### Americium-241 by method RICH-RC-5072:

The first analysis batch showed signs of thorium in the alpha spectra. The Am-241 results will not be reported in this report at this time. The laboratory is awaiting direction from the client on action with respect to this analysis.

### Plutonium-238, -239/40 by method RICH-RC-5010:

The LCS, batch blank, samples and sample duplicate (J008D0) results are within contractual requirements.

## Uranium-234, 235 and 238 by method RICH-RC-5079:

The LCS, batch blank, samples and sample duplicate (J008D0) results are within contractual requirements.

#### Gamma Spectroscopy

#### Gamma Scan by method RICH-RC-5017:

The MDA is greater than the CRDL for Co-60, Eu-152, Eu-154 and Eu-155 due to insufficient mass provided. Except as noted, the LCS, batch blank, samples and sample duplicate (J008D0) results are within contractual requirements.

#### **Gas Proportional Counting**

## Total Strontium by method RICH-RC-5006:

The LCS, batch blank, samples and sample duplicate (J008D0) results are within contractual requirements.

#### **Chemical Analyses**

#### Chromium Hex by EPA method 7196A:

The LCS, batch blank, sample duplicate (J008D9), matrix spike (J008D9), color (J008D9 PbCrO4) spike, and sample results are within contractual requirements.



Bechtel Hanford, Inc. December 20, 2002 Page 3

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager, or a designee as verified by the following signature.

Reviewed and approved:

Barbara M. Gillespie

Project Manager

**Drinking Water Method Cross References** 

	DRINKING WAT	ER ASTM METHOD CROSS REFERENCES
Referenced Method	Isotope(s)	STL Richland's SOP number
EPA 901.1	Cs-134, I-131	RICH-RC-5017
EPA 900.0	Alpha & Beta	RICH-RC-5014
EPA 903.1	Ra-226	RICH-RC-5005
EPA 904.0	Ra-228	RICH-RC-5005
EPA 905.0	Sr89/90	RICH-RC-5006
ASTM D2460	Total Radium	RICH-RC-5027
Standard Method 7500-U-C & ASTM D5174	Uranium	RICH-RC-5058
EPA 906.0	Tritium	RICH-RC-5007
NOTE:		
The Gross Alpha LCS is prepared with Am-2	41 (unless otherwi	se specified in the case narrative)
The Gross Beta LCS is prepared with Sr/Y-9	0 (unless otherwis	e specified in the case narrative)

## **Uncertainty Estimation**

STL Richland has adopted the internationally accepted approach to estimating uncertainties described in "NIST Technical Note 1297, 1994 Edition". The approach, "Law of Propagation of Errors", involves the identification of all variables in an analytical method which are used to derive a result. These variables are related to the analytical result (R) by some functional relationship, R = constants \* f(x,y,z,...). The components (x,y,z) are evaluated to determine their contribution to the overall method uncertainty. The individual component uncertainties  $(u_i)$  are then combined using a statistical model that provides the most probable overall uncertainty value. All component uncertainties are categorized as type A, evaluated by statistical methods, or type B, evaluated by other means. Uncertainties not included in the components, such as sample homogeneity, are combined with the component uncertainty as the square root of the sum-of-the-squares of the individual uncertainties. The uncertainty associated with the derived result is the combined uncertainty  $(u_c)$  multiplied by the coverage factor (1,2, or 3).

When three or more sample replicates are used to derive the analytical result, the type A uncertainty is the standard deviation of the mean value (S/vn), where S is the standard deviation of the derived results. The type B uncertainties are all other random or non-random components that are not included in the standard deviation.

The derivation of the general "Law of Propagation of Errors" equations and specific example are available on request.

**Report Definitions** 

	Report Definitions
Action Lev	An agreed upon activity level used to trigger some action when the final result is greater than or equal to the Action Level. Often the Action Level is related to the Decision Limit.
Batch	The QC preparation batch number that relates laboratory samples to QC samples that were prepared and analyzed together.
Bias	Defined by the equation (Result/Expected)-1 as defined by ANSI N13.30.
COC No	Chain of Custody Number assigned by the Client or STL Richland.
Count Error (#s)	Poisson counting statistics of the gross sample count and background. The uncertainty is absolute and in the same units as the result. For Liquid Scintillation Counting (LSC) the batch blank count is the background.
Total Uncert (#s)  u <sub>c</sub> _Combined  Uncertainty.	All known uncertainties associated with the preparation and analysis of the sample are propagated to give a measure of the uncertainty associated with the result, $u_c$ the combined uncertainty. The uncertainty is absolute and in the same units as the result.
(#s), Coverage	The coverage factor defines the width of the confidence interval, 1, 2 or 3 standard deviations.
Factor CRDL (RL)	Contractual Required Detection Limit as defined in the Client's Statement Of Work or STL Richland "default" nominal detection limit. Often referred to the reporting level (RL)
<b>Lc</b>	Decision Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume associated with the sample. The Type I error probability is approximately 5%. Lc=(1.645 * Sqrt(2*(BkgrndCnt/BkgrndCntMin)/SCntMin)) * (ConvFct/(Eff*Yld*Abn*Vol) * lngrFct). For LSC methods the batch blank is used as a measure of the background variability. Lc cannot be calculated when the background count is zero.
Lot-Sample No	The number assigned by the LIMS software to track samples received on the same day for a given client. The sample number is a sequential number assigned to each sample in the Lot.
MDC MDA	Detection Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume with a Type 1 and 11 error probability of approximately 5%. MDC = (4.65 * Sqrt((BkgrndCnt/BkgrndCntMin)/SCntMin) + 2.71/SCntMin) * (ConvFct/(Eff * Yld * Abn * Vol) * IngrFct). For LSC methods the batch blank is used as a measure of the background variability.
Primary Detector	The instrument identifier associated with the analysis of the sample aliquot.
Ratio U-234/U-238	The U-234 result divided by the U-238 result. The U-234/U-238 ratio for natural uranium in NIST SRM 4321C is 1.038.
Rst/MDC	Ratio of the Result to the MDC. A value greater than 1 may indicate activity above background at a high level of confidence. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.
Rst/TotUcert	Ratio of the Result to the Total Uncertainty. If the uncertainty has a coverage factor of 2 a value greater than 1 may indicate activity above background at approximately the 95% level of confidence assuming a two-sided confidence interval. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.
Report DB No	Sample Identifier used by the report system. The number is based upon the first five digits of the Work Order Number.
RER	The equation Replicate Error Ratio = (S-D)/[sqrt(TPUs <sup>2</sup> + TPUd <sup>2</sup> )] as defined by ICPT BOA where S is the original sample result, D is the result of the duplicate, TPUs is the total uncertainty of the original sample and TPUd is the total uncertainty of the duplicate sample.
SDG	Sample Delivery Group Number assigned by the Client or assigned by STL Richland upon sample receipt.
Sum Rpt Alpha Spec Rst(s)	The sum of the reported alpha spec results for tests derived from the same sample excluding duplicate result where the results are in the same units.
Work Order	The LIMS software assign test specific identifier.
Yield	The recovery of the tracer added to the sample such as Pu-242 used to trace a Pu-239/40 method.
· Control of the cont	

Date: 20-Dec-02

# Sample Results Summary STL Richland STLRL

Ordered by Client Sample ID, Batch No.

**Report No.: 21240** 

**SDG No: W03908** 

Client ID	Work Order Number	Parameter	Result +- Uncertainty ( 2s)	Qual	Units	Yield	MDC MDA	RER
J008D0	FDH591AE	PU-238	-8.72E-04 +- 1.7E-03	U	pCi/g	71.45%	2.09E-02	
		PU239/40	6.79E-02 +- 3.7E-02		pCi/g	71.45%	2.46E-02	
J008D0	FDH591AC	U-234	9.35E-01 +- 2.3E-01		pCi/g	61.38%	2.74E-02	
		U-235	2.91E-02 +- 2.4E-02		pCi/g	61.38%	1.32E-02	1
		U-238	8.85E-01 +- 2.2E-01		pCi/g	61.38%	3.34E-02	
J008D0	FDH591AH	CO-60	-1.61E-02 +- 3.0E-02	U	pCi/g		5.01E-02	
		CS-137	4.18E-01 +- 7.2E-02		pCi/g		4.90E-02	
		EU-152	-1.09E-01 +- 9.9E-02	U	pCi/g		1.20E-01	
		EU-154	1.08E-02 +- 9.1E-02	U	pCi/g		1.56E-01	
		EU-155	3.94E-02 +- 8.4E-02	U	pCi/g		1.40E-01	
J008D0	FDH591AD	STRONTIUM	5.33E-01 +- 1.8E-01		pCi/g	70.80%	1.43E-01	
J008D0	9FDH5910	HEXCHROME	2.36E-01 +- 0.0E+00		mg/kg	N/A	8.00E-02	
J008D0 ĐUP	FDH591AJ	PU-238	0.00E+00 +- 1.1E-02	U	pCi/g	68.22%	1.22E-02	0.2
		PU239/40	7.99E-02 +- 4.0E-02		pCi/g	68.22%	2.15E-02	0.4
J008D0 DUP	FDH591AL	U-234	9.52E-01 +- 2.3E-01		pCi/g	68.04%	3.40E-02	0.1
		U-235	2.31E-02 +- 2.1E-02		pCi/g	68.04%	1.25E-02	0.4
		U-238	9.83E-01 +- 2.3E-01		pCi/g	68.04%	2.61E-02	0.6
J008D0 DUP	FDH591AM	CO-60	3.76E-02 +- 3.1E-02	บ	pCi/g		5.57E-02	2.5
		CS-137	4.41E-01 +- 7.8E-02		pCi/g		4.46E-02	0.4
		EU-152	1.11E-02 +- 6.2E-02	U	pCi/g		1.07E-01	2.1
		EU-154	2.80E-02 +- 8.5E-02	υ	pCi/g		1.50E-01	0.3
		EU-155	4.99E-02 +- 5.4E-02	U	pCi/g		9.41E-02	0.2
J008D0 DUP	FDH591AN	STRONTIUM	4.07E-01 +- 2.1E-01		pCi/g	31.80%	3.32E-01	0.9
J008D9	FDH5L1AE	CO-60	8.35E-03 +- 2.9E-02	U	pCi/g		5.02E-02	
		CS-137	5.62E-02 +- 3.9E-02		pCi/g		4.71E-02	
		EU-152	5.54E-02 +- 7.1E-02	U	pCi/g		1.22E-01	
		EU-154	1.90E-02 +- 9.4E-02	U	pCi/g		1.63E-01	
		EU-155	1.47E-02 +- 4.6E-02	U	pCi/g		7.72E-02	
J008D9	FDH5L1AC	STRONTIUM	1.74E+00 +- 4.9E-01		pCi/g	65.70%	1.57E-01	
J008D9	9FDH5L10	HEXCHROME	4.98E-01 +- 0.0E+00		mg/kg	N/A	8.00E-02	
J008D9 DUP	FDH5L1GR	HEXCHROME	1.84E-01 +- 0.0E+00		mg/kg	N/A	8.00E-02	
Number of Results:	31							

STL Richland rptSTLRchSaSum

V3.97 A97

<sup>-</sup> Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.

 $<sup>\ \,</sup> U \ Qual \cdot Analyzed \ for, but the \ result \ is \ less \ than \ the \ Mdc/Mda|Total \ Uncert \ or \ gamma \ scan \ software \ did \ not \ identify \ the \ nuclide.$ 

## QC Results Summary STL Richland STLRL

Ordered by QC Type, Batch No.

**Report No.: 21240** 

**SDG No.: W03908** 

Date: 20-Dec-02

QC Type	Work Order Number	Parameter	Result +- Uncertainty ( 2s)	Qual	Units	Yield	Recovery	Bias	MDC MDA
BLANK QC	FDMNN1AA	PU-238	0.00E+00 +- 1.6E-02	U	pCi/g	47.92%			1.77E-02
		PU239/40	1.83E-02 +- 2.3E-02	U	pCi/g	47.92%			3.12E-02
BLANK QC	FDMN01AA	U-234	-6.62E-04 +- 1.3E-03	U	pCi/g	90.32%			1.58E-02
		U-235	0.00E+00 +- 8.1E-03	υ	pCi/g	90.32%			8.96E-03
		U-238	5.95E-03 +- 9.5E-03	U	pCi/g	90.32%			1.58E-02
BLANK QC	FDMN61AA	CO-60	4.17E-02 +- 1.8E-02	U	pCi/g				3.79E-02
		CS-137	7.19E-03 +- 2.0E-02	U	pCi/g				3.41E-02
		EU-152	-2.45E-02 +- 4.5E-02	U	pCi/g			•	7.64E-02
		EU-154	3.54E-02 +- 5.4E-02	Ų	pCi/g				9.86E-02
		EU-155	9.56E-03 +- 3.8E-02	U	pCi/g				6.45E-02
BLANK QC	FDMPE1AA	STRONTIUM	-1.97E-02 +- 4.9E-02	U	pCi/g	91.30%			1.22E-01
LCS	FDMNN1AC	PU239/40	3.61E+00 +- 7.4E-01		pCi/g	37.70%	104.20%	0.0	3.97E-02
LCS	FDMN01AC	U-234	1.78E+00 +- 3.7E-01		pCi/g	87.45%	108.00%	0.1	9.57E-03
		U-238	1.70E+00 +- 3.6E-01		pCi/g	87.45%	98.40%	0.0	9.57E-03
LCS	FDMN61AC	CS-137	9.23E-01 +- 1.4E-01		pCi/g				7.22E-02
LCS	FDMPE1AC	STRONTIUM	1.03E+00 +- 3.0E-01		pCi/g	85.80%	90.12%	-0.1	1.31E-01
MATRIX SPI	FDH5L1FS	HEXCHROME	3.87E+01 +- 0.0E+00		mg/kg	N/A	93.91%	-0.1	8.00E-02
LCS	FDMPN1C	HEXCHROME	3.79E+01 +- 0.0E+00		mg/L	N/A	94.84%	-0.1	2.00E-03
BLANK QC	FDMPN1B	HEXCHROME	2.00E-02 +- 0.0E+00		mg/L	N/A			2.00E-03

Number of Results:

19

#### **SAMPLE RESULTS**

Lab Name:

STL Richland

Lot-Sample No.: J2K200322-2

Client Sample ID: J008D0

SDG:

W03908

Collection Date: 11/20/2002 8:30:00 AM

Date: 20-Dec-02

Report No.:

21240

**Received Date:** 

11/20/2002 2:29:00 PM

COC No.:

B00-030-071

**Matrix:** 

SOIL

Ordered by Client Sample ID, Batch No.

PU-239/40  Batch: 23255  PU-239/40  Batch: 23255	-8.72E-0	t U	1.7E-03 3.5E-02	1.7E-03 3.7E-02	D: 9FDH5910 2.09E-02 2.46E-02 D: 9FDH5910	pCi/g 4.53E-03 pCi/g 6.41E-03	71.45% 1.00E+00 71.45% 1.00E+00	-1.	12/13/02 01:01 p 12/13/02 01:01 p	2.0 G 2.0 G	PUISO_PLATE_AEA ALP37 PUISO_PLATE_AEA ALP37
PU239/40 Batch: 23255	6.79E-02 6.29 Work Or	der: FDI	3.5E-02 H591AC	3.7E-02	2.46E-02	4.53E-03 pCi/g 6.41E-03	1.00E+00 71.45%	-1. (2.8)	·	 G 2.0	ALP37 PUISO_PLATE_AEA
Batch: 23255	529 Work Or	der: FDI	H591AC			pCi/g 6.41E-03	71.45%	(2.8)	12/13/02 01:01 p	 2.0	PUISO_PLATE_AEA
Batch: 23255	529 Work Or	der: FDI	H591AC			6.41E-03		• •	12/13/02 01:01 p		
				Report DB I	ID: 9FDH5910		1.00E+00	(3.7)		 G	ALP37
				Report DB I	ID: 9FDH5910						
U-234	9.35E-0 <sup>-</sup>		1.3F-01								
			1.00	2.3E-01	2.74E-02	pCi/g	61.38%	(34.1)	12/11/02 04:13 p	1.98	UISO_IE_PLATE_AE
						7.15E-03	1.00E+00	(8.2)		G	ALP1
U-235	2.91E-02	•	2.4E-02	2.4E-02	1.32E-02	pCi/g	61.38%	(2.2)	12/11/02 04:13 p	1.98	UISO_IE_PLATE_AE
		-					1.00E+00	(2.4)		G	ALP1
U-238	8.85E-0		1.3E-01	2.2E-01	3.34E-02	pCi/g	61.38%	(26.5)	12/11/02 04:13 p	1.98	UISO_IE_PLATE_AE
Ų <b>1</b> 00	0.002 0					1.01E-02	1.00E+00	(8.1)		G	ALP1
		<del>_</del>				<del>_</del>		Ratio U-234/	238 = 1.1	 	
Batch: 23255	530 Work O	der: FDI	H591 <b>A</b> H	Report DB	ID: 9FDH5910	ı					
CO-60	-1.61E-0	2 U	3.0 <b>E-</b> 02	3.0E-02	5.01E-02	pCi/g		-0.32	12/3/02 10:08 a	44.9	GAMMA_GS
							5.00E-02	-(1.1)		g	GER2\$1
CS-137	4.18E-0	l	7.2E-02	7.2E-02	4.90E-02	pCi/g		(8.5)	12/3/02 10:08 a	44.9	GAMMA_GS
							1.00E-01	(11.6)		g	GER2\$1
EU-152	-1.09E-0	1 U	9.9E-02	9.9E-02	1.20E-01	pCi/g		-0.91	12/3/02 10:08 a	44.9	GAMMA_GS
20 102	,,55 <b>2 0</b>	. •				_	1.00E-01	-(2.2)		g	GER2\$1
EU-154	1.08E-0	) II	9.1E-02	9.1E-02	1.56E-01	pCi/g		0.07	12/3/02 10:08 a	44.9	GAMMA_GS
<b>20</b>	1.00L-0.	. 0	0.12.02	•= ==			1.00E-01	0.24		g	GER2\$1

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume. U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

#### **SAMPLE RESULTS**

Date: 20-Dec-02

Lab Name:

**STL Richland** 

SDG:

W03908

Collection Date: 11/20/2002 8:30:00 AM

Lot-Sample No.: J2K200322-2

Report No.:

21240

**Received Date:** 

11/20/2002 2:29:00 PM

Client Sample ID: J008D0

COC No.:

B00-030-071

Matrix:

SOIL

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Епог ( 2 s)	Total Uncert(2 s)	MDC   MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcerl	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
EU-155	3.94E-02	U	8.4E-02	8.4E-02	1.40E-01	pCi/g		0.28	12/3/02 10:08 a		44.9	GAMMA_GS
							1.00E-01	0.94			g	GER2\$1
Batch: 2325531	Work Ord	er: FDI	1591AD	Report DB ID	D: 9FDH5910			······································				
STRONTIUM	5.33E-01		1.1E-01	1.8E-01	1.43E-01	pCi/g	70.80%	(3.7)	12/11/02 07:54 a		6.02	SRTOT_SEP_PRECIP
						6.61E-02		(6.)			G	GPC31B
Batch: 2325532	Work Ord	er:		Report DB ID	D: 9FDH5910							
HEXCHROME	2.36E-01			0.0E+00	8.00E-02	mg/kg	N/A	<i>(3.)</i>	12/4/02		2.5	EPA7196
								N/A			G	
									*			

Number of Results: 12

#### **SAMPLE RESULTS**

Lab Name:

**STL Richland** 

SDG:

W03908

Collection Date: 11/20/2002 9:25:00 AM

Date: 20-Dec-02

Lot-Sample No.: J2K200322-1

Report No.:

21240

**Received Date:** 

11/20/2002 2:29:00 PM

Client Sample ID: J008D9

COC No.:

B00-030-073

Matrix:

SOIL

Ordered by Client Sample ID, Batch No.

										0.00.0	out by onem	Dampie 10, Daton 110.
Parameter	Result	Qual	Count Error ( 2 s)	Total Uncert(2 s)	MDC   MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 2325530	Work Ord	er: FDI	I5L1AE	Report DB IC	): 9FDH5L10				<u></u>			
CO-60	8.35E-03	υ	2.9E-02	2.9E-02	5.02E-02	pCi/g		0.17	12/3/02 10:09 a		42.8	GAMMA_GS
							5.00E-02	0.58			g	GER5\$1
CS-137	5.62E-02		3.9E-02	3.9E-02	4.71E-02	pCi/g		(1.2)	12/3/02 10:09 a		42.8	GAMMA_GS
							1.00E-01	(2.9)			g	GER5\$1
EU-152	5.54E-02	U	7.1E-02	7.1E-02	1,22E-01	pCi/g		0.45	12/3/02 10:09 a		42.8	GAMMA_GS
							1.00E-01	(1.6)			g	GER5\$1
EU-154	1.90E-02	U	9.4E-02	9.4E-02	1.63E-01	pCi/g		0.12	12/3/02 10:09 a		42.8	GAMMA_GS
						. •	1.00E-01	0.4			g	GER5\$1
EU-155	1.47E-02	U	4.6E-02	4.6E-02	7.72E-02	pCi/g		0.19	12/3/02 10:09 a		42.8	GAMMA_GS
							1.00E-01	0.64			g	GER5\$1
Batch: 2325531	Work Ord	er: FD+	I5L1AC	Report DB I	: 9FDH5L10	<u> </u>				<del></del>	,	
STRONTIUM	1.74E+00		1.9E-01	4.9E-01	1.57E-01	pCi/g	65.70%	(11.1)	12/11/02 07:54 a		6.02	SRTOT_SEP_PRECIP
						7.29E-02		(7.1)			G	GPC31A
Batch: 2325532	Work Ord	er:		Report DB ID	9FDH5L10							
HEXCHROME	4.98E-01			0.0E+00	8.00E-02	mg/kg	N/A	(6.2)	12/4/02		2.5	EPA7196
								N/A			G	

Number of Results: 7

Comments:

STL Richland rptSTLRchSample V3.97 A97

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume. U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

#### **SAMPLE RESULTS**

Date: 20-Dec-02

Lab Name:

STL Richland

SDG:

W03908

Collection Date: 11/20/2002 9:25:00 AM

Lot-Sample No.: J2K200322-1

Report No.:

21240

**Received Date:** 

11/20/2002 2:29:00 PM

Client Sample ID: J008D9

COC No.:

B00-030-073

Matrix:

SOIL

Ordered by Client Sample ID, Batch No.

						<del></del>				,	
	Result	Count	Total	MDC   MDA,	Rpt Unit,	Yieid	Rst/MDC,	Analysis,	Total Sa	Aliquot	Analy Method,
Parameter		ual Error (2s)	Uncert(2 s)	Action Lev	Lc	CRDL(RL)	Rst/TotUcert	Prep Date	Şizə	Size	Primary Detector

Date: 20-Dec-02

### **DUPLICATE RESULTS**

Lab Name:

STL Richland

SDG:

W03908

Collection Date: 11/20/2002 8:30:00 AM

Lot-Sample No.: J2K200322-2

Report No.: 21240 **Received Date:** 

11/20/2002 2:29:00 PM

Client Sample ID: J008D0 DUP

COC No.:

B00-030-071

Matrix:

SOIL

Parameter	Result, Orig Rst	Qual	Count Error ( 2 s)	Total Uncert(2 s)	MDC   MDA, Action Lev	`·	Yleld	Rst/MDC, Rst/TotUcert	Anatysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 2325527	Work Orde	r: FDH59	1AJ	Report DB ID: F	DH591JR	Orig Sa	DB ID: 9FC	H5910				
PU-238	0.00E+00	U	0.0E+00	1.1E-02	1.22E-02	pCi/g	68.22%	0.	12/13/02 01:01 p		1.94	PUISO_PLATE_AEA
	-8.72E-04	U RER	0.2			1.00E+00		0.			G	ALP38
PU239/40	7.99E-02		3.8E-02	4.0E-02	2.15E-02	pCi/g	68.22%	(3.7)	12/13/02 01:01 p		1.94	PUISO_PLATE_AEA
	6.79E-02	RER	0.4			1.00E+00		(4.)			G	ALP38
					- · · —					Alpha	Spec Result	Sum = 8.0E-02
Batch: 2325529	Work Orde	er: FDH59	1AL	Report DB ID: F	DH591LR	Orig Sa	DB ID: 9FC	H5910				
U-234	9.52E-01		1.3E-01	2.3E-01	3.40E-02	pCi/g	68.04%	(28.)	12/11/02 04:13 p		1.92	UISO_IE_PLATE_AE
	9.35E-01	RER	0.1			1.00E+00		(8.3)			G	ALP2
U-235	2.31E-02		2.1E-02	2.1E-02	1.25E-02	pCi/g	68.04%	(1.8)	12/11/02 04:13 p		1.92	UISO_IE_PLATE_AE
	2.91E-02	RER	0.4			1.00E+00		(2.2)			G	ALP2
U-238	9.83E-01		1.3E-01	2.3E-01	2.61E-02	pCi/g	68.04%	(37.6)	12/11/02 04:13 p		1.92	UISO_IE_PLATE_AE
	8.85E-01	RER	0.6			1.00E+00		(8.4)			G	ALP2
								Ratio U-234/23	38 = 1.0	Alpha	Spec Result	Sum = 2.0E+00
Batch: 2325530	Work Orde	er: FDH59	1AM	Report DB ID: F	DH591MR	Orig Sa	<b>DB ID:</b> 9F0	DH5910				
CO-60	3.76E-02		3.1E-02	3.1E-02	5.57E-02	pCi/g		0.68	12/4/02 10:59 a		44.9	GAMMA_GS
	-1.61E-02		2.5			5.00E-02		(2.5)			g	GER4\$1
CS-137	4.41E-01		7.8E-02	7.8E-02	4.46E-02	pCi/g		(9.9)	12/4/02 10:59 a		44.9	GAMMA_GS
55 .5.	4.18E-01	RER	0.4			1.00E-01		(11.3)			g	GER4\$1
EU-152	1.11E-02		6.2E-02	6.2E-02	1.07E-01	pCi/g		0.1	12/4/02 10:59 a		44.9	GAMMA_GS
LO-132	-1.09E-01			•		1.00E-01		0.36			g	GER4\$1
EU-154		U	8.5E-02	8.5E-02	1.50E-01			0.19	12/4/02 10:59 a		44.9	GAMMA_GS
EU-154		_	_	0.0L 0L		1.00E-01		0.66			g	GER4\$1
12	1.08E-02	O REM	0.3									

STL Richland rptSTLRchDupV3. 97 A97

<sup>-</sup> Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.

U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

Date: 20-Dec-02

### **DUPLICATE RESULTS**

Lab Name:

**STL Richland** 

SDG:

W03908

Collection Date: 11/20/2002 8:30:00 AM

Lot-Sample No.: J2K200322-2

Report No.:

21240

Received Date:

11/20/2002 2:29:00 PM

Client Sample ID: J008D0 DUP

COC No.:

B00-030-071

Matrix:

SOIL

Parameter	Result, Orig Rst	Qual	Count Error ( 2 s)	Total Uncert(2 s)	MDC   MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
EU-155	4.99E-02	U	5.4E-02	5.4E-02	9.41E-02	pCi/g		0.53	12/4/02 10:59 a		44.9	GAMMA_GS
	3.94E-02	U RER	0.2			1.00E-01		(1.9)			<b>g</b>	GER4\$1
Batch: 2325531	Work Orde	r: FDH59	1AN	Report DB ID: F	DH591NR	Orig Sa	DB ID: 9FC	H5910				
STRONTIUM	4.07E-01		1.8E-01	2.1E-01	3.32E-01	pCi/g	31.80%	(1.2)	12/11/02 07:54 a		6.0	SRTOT_SEP_PRECIP
	5.33E-01	RER	0.9					(3.9)	·····		G	GPC31C

Number of Results: 11

Date: 20-Dec-02

### **DUPLICATE RESULTS**

Lab Name:

STL Richland

SDG:

W03908

Collection Date: 11/20/2002 9:25:00 AM

Lot-Sample No.: J2K200322-1

Report No. :

21240

Received Date:

11/20/2002 2:29:00 PM

Client Sample ID: J008D9 DUP

COC No.:

B00-030-073

Matrix:

SOIL

Parameter	Result, Orlg Rst	Qual	Count Error ( 2 s)	Total Uncert(2 s)	MDC   MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 2325532	Work Orde	er:		Report DB ID: F	DH5L1GR	Orig Sa	DB ID: 9F	)H5L10				
HEXCHROME	1.84E-01			0.0E+00	8.00E-02	mg/kg	N/A	(2.3)	12/4/02		2.5	EPA7196
	4.98E-01	RPD	0.9					N/A			G	

Number of Results: 1

### **BLANK RESULTS**

Lab Name:

STL Richland

SDG:

W03908

Lot-Sample No.: #Error

**Report No.:** 21240

Matrix: WATER

Date: 20-Dec-02

Parameter	Result	Qual	Count Error ( 2 s)	Total Uncert(2 s)	MDC MD A,	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcer	Analysis, † Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 2325532	Work Orde	r:		Report DB ID:	FDMPN1B							
HEXCHROME	2.00E-02			0.0E+00	2.00E-03	mg/L	N/A	(10.)	12/4/02		100.0	EPA7196
								N/A			ML	

Number of Results: 1

### **BLANK RESULTS**

Lab Name:

STL Richland

SDG:

W03908

Lot-Sample No.: J2K210000-527

Report No.: 21240

Matrix: SOIL

Date: 20-Dec-02

Parameter	Result	Qual	Count Error ( 2 s)	Total Uncert(2 s)	MDC MD A,	Rpt Unit, CRDL	Yieldi	Rst/MDC, Rst/TotUce		Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 2325527	Work Orde	r: FDMI	NN1AA	Report DB ID:	FDMNN1AB							
PU-238	0.00E+00	U	0.0E+00	1.6E-02	1.77E-02	pCi/g	47.92%	0.	12/13/02 01:02 p		2.0	PUISO_PLATE_AEA
	••	-				1.00E+00		0.			G	ALP39
PU239/40	1.83E-02	U	2.3E-02	2.3E-02	3.12E-02	pCi/a	47.92%	0.58	12/13/02 01:02 p		2.0	PUISO_PLATE_AEA
1 0233/40	1.000-02	J	2.02 02		6.78E-03			(1.6)			<b>G</b>	ALP39

Number of Results: 2

Comments:

STL Richland

rptSTLRchBlank V3.97 A97

### **BLANK RESULTS**

Lab Name:

STL Richland

SDG:

W03908

Lot-Sample No.: J2K210000-529

Report No.: 21240

Matrix: SOIL

Date: 20-Dec-02

Result	Qual	Count Error ( 2 s)	Total Uncert(2 s)	MDC   MD A,	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcerl	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Work Order	: FDMN	01AA	Report DB ID:	FDMN01AB							
-6.62E-04	U	1.3E-03	1.3E-03	1.58E-02	pCi/g	90.32%	-0.04	12/11/02 04:14 p		2.0	UISO_IE_PLATE_AE
				3.44E-03	1.00E+00		-1.			G	ALP9
0.00E+00	U	0.0E+00	8.1E-03	8.96E-03	pCi/g	90.32%	0.	12/11/02 04:14 p		2.0	UISO_IE_PLATE_AE
					1.00E+00		0.			G	ALP9
5.95E-03	U	9.4E-03	9.5E-03	1.58E-02	pCi/g	90.32%	0.38	12/11/02 04:14 p		2.0	UISO_IE_PLATE_AE
				3.44E-03	1.00E+00		(1.3)			G	ALP9
	Work Order -6.62E-04	Work Order: FDMN -6.62E-04 U 0.00E+00 U	Result         Qual         Error ( 2 s)           Work Order:         FDMN01AA           -6.62E-04         U         1.3E-03           0.00E+00         U         0.0E+00	Result         Qual         Error ( 2 s)         Uncert(2 s)           Work Order:         FDMN01AA         Report DB ID:           -6.62E-04         U         1.3E-03         1.3E-03           0.00E+00         U         0.0E+00         8.1E-03	Result         Qual         Error ( 2s)         Uncert(2 s)         A,           Work Order:         FDMN01AA         Report DB ID:         FDMN01AB           -6.62E-04         U         1.3E-03         1.3E-03         1.58E-02           3.44E-03         3.44E-03         8.96E-03           5.95E-03         U         9.4E-03         9.5E-03         1.58E-02	Result         Qual         Error ( 2 s)         Uncert(2 s)         A,         CRDL           Work Order:         FDMN01AA         Report DB ID:         FDMN01AB           -6.62E-04         U         1.3E-03         1.58E-02         pCi/g           3.44E-03         1.00E+00           0.00E+00         U         0.0E+00         8.1E-03         8.96E-03         pCi/g           5.95E-03         U         9.4E-03         9.5E-03         1.58E-02         pCi/g	Result         Qual         Error ( 2 s)         Uncert(2 s)         A,         CRDL         Yield           Work Order:         FDMN01AA         Report DB ID:         FDMN01AB           -6.62E-04         U         1.3E-03         1.58E-02         pCi/g         90.32%           0.00E+00         U         0.0E+00         8.1E-03         8.96E-03         pCi/g         90.32%           5.95E-03         U         9.4E-03         9.5E-03         1.58E-02         pCi/g         90.32%	Result         Qual         Error ( 2 s)         Uncert(2 s)         A,         CRDL         Yield         Rst/TotUcert           Work Order:         FDMN01AA         Report DB ID:         FDMN01AB           -6.62E-04         U         1.3E-03         1.58E-02         pCi/g         90.32%         -0.04           0.00E+00         U         0.0E+00         8.1E-03         8.96E-03         pCi/g         90.32%         0.           1.00E+00         U         9.4E-03         9.5E-03         1.58E-02         pCi/g         90.32%         0.38	Result         Qual         Error ( 2 s)         Uncert(2 s)         A,         CRDL         Yield         Rst/TotUcert         Prep Date           Work Order:         FDMN01AA         Report DB ID:         FDMN01AB           -6.62E-04         U         1.3E-03         1.3E-03         1.58E-02         pCi/g         90.32%         -0.04         12/11/02 04:14 p           0.00E+00         U         0.0E+00         8.1E-03         8.96E-03         pCi/g         90.32%         0.         12/11/02 04:14 p           5.95E-03         U         9.4E-03         9.5E-03         1.58E-02         pCi/g         90.32%         0.38         12/11/02 04:14 p	Result         Qual         Error ( 2 s)         Uncert(2 s)         A,         CRDL         Yield         Rst/TotUcert         Prep Date         Size           Work Order:         FDMN01AA         Report DB ID:         FDMN01AB         FDMN0	Result         Qual         Error ( 2 s)         Uncert(2 s)         A,         CRDL         Yield         Rst/TotUcert         Prep Date         Size         Size         Size           Work Order:         FDMN01AA         Report DB ID:         FDMN01AB         FDMN01AB

Ratio U-234/238 = -0.1

Number of Results: 3

### **BLANK RESULTS**

Lab Name:

STL Richland

SDG:

W03908

Lot-Sample No.: J2K210000-530

Report No.: 21240

Matrix: SOIL

Date: 20-Dec-02

Parameter	Result	Qual	Count Error ( 2 s)	Total Uncert(2 s)	MDC IMD A,	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 2325530	Work Orde	r: FDM	V61AA	Report DB ID:	FDMN61AX							
CO-60	4.17E-02	U	1.8E-02	1.8E-02	3.79E-02	pCi/g		(1.1)	12/3/02 10:10 a		52.0	GAMMA_GS
						5.00E-02		(4.6)			g	GER4\$1
CS-137	7.19E-03	U	2.0E-02	2.0E-02	3.41E-02	pCi/g		0.21	12/3/02 10:10 a		52.0	GAMMA_GS
						1.00E-01		0.73			g	GER4\$1
EU-152	-2.45E-02	U	4.5E-02	4.5E-02	7.64E-02	pCi/g		-0.32	12/3/02 10:10 a		52.0	GAMMA_GS
						1.00E-01		-(1.1)			g	GER4\$1
EU-154	3.54E-02	U	5.4E-02	5.4E-02	9.86E-02	pCi/g		0.36	12/3/02 10:10 a		52.0	GAMMA_GS
						1.00E-01		(1.3)			g	GER4\$1
EU-155	9.56E-03	U	3.8E-02	3.8E-02	6.45E-02	pCi/g		0.15	12/3/02 10:10 a		52.0	GAMMA_GS
					<u> </u>	1.00E-01		0.51			9	GER4\$1

Number of Results: 5

### **BLANK RESULTS**

Lab Name:

**STL Richland** 

SDG:

W03908

Lot-Sample No.: J2K210000-531

Report No.: 21240

Matrix: SOIL

Date: 20-Dec-02

Parameter	Result	Qual	Count Error ( 2 s)	Total Uncert(2 s)	MDC MD A,	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TolUcer	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 2325531	Work Orde	r: FDMF	PE1AA	Report DB ID:	FDMPE1AB							
STRONTIUM	-1.97E-02	U	4.8E-02	4.9E-02	1.22E-01	pCi/g	91.30%	-0.16	12/11/02 07:54 a		6.0	SRTOT_SEP_PRECIP
					5.64E-02			-0.81			G	GPC31D

Number of Results: 1

### **LCS RESULTS**

Lab Name:

STL Richland

SDG:

W03908

Lot-Sample No.: #Error

**Report No.:** 21240

Matrix: WATER

Date: 20-Dec-02

Parameter	Result Qual	Count Error ( 2 s)	Total Uncert(2 s)	MDC MD	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 2325532	Work Order:		Report DB	ID: FDMPN1	С							
HEXCHROME	3.79E+01		0.0E+00	2.00E-03 r	ng/L	N/A	4.00E+01		94.84%	12/4/02	100.0	EPA7196
					Re	c Limits:			-0.1		ML	

Number of Results: 1

Comments:

Bias

LCS RESULTS

Lab Name:

STL Richland

SDG:

W03908

Lot-Sample No.: J2K210000-527

Report No.: 21240

Matrix: SOIL

Date: 20-Dec-02

Parameter	Result	Count Qual Error ( 2 s	Total Uncert(2 s)		Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 2325527	Work Orde	er: FDMNN1AC	Report D	BID: FDMNN1CS	3							
PU239/40	3.61E+00	3.5E-01	7.4E-01	3.97E-02 pC	Çi/g	37.70%	3.46E+00	1.7E-01	104.20%	12/13/02 01:02 p	2.0	PUISO_PLATE_AEA
					Red	: Limits:	70.	130.	0.0		G	ALP41

Number of Results: 1

### **LCS RESULTS**

Lab Name:

STL Richland

SDG:

W03908

Lot-Sample No.: J2K210000-529

**Report No.:** 21240

Matrix: SOIL

Date: 20-Dec-02

Parameter	Result	Count Qual Error (2s)	Total Uncert(2 s)	MDC MD	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 2325529	Work Orde	er: FDMN01AC	Report DE	ID: FDMN01	cs					<del></del>	_	
U-234	1.78E+00	1.6E-01	3.7 <b>E-</b> 01	9.57E-03	pCi/g	87.45%	1.65E+00	1.1E-02	108.00%	12/11/02 04:14 p	2.0	UISO_IE_PLATE_AE
						Rec Limits:	70.	130.	0.1		G	ALP10
U-238	1.70E+00	1.5E-01	3.6E-01	9.57E-03 (	oCi/g	87.45%	1.72E+00	1.1E-02	98.40%	12/11/02 04:14 p	2.0	UISO_IE_PLATE_AE
						Rec Limits:	70.	130.	0.0		G	ALP10

Number of Results: 2

Comments:

Bias

### LCS RESULTS

Lab Name:

STL Richland

SDG:

W03908

Lot-Sample No.: J2K210000-530

Report No.: 21240

Matrix: SOIL

Date: 20-Dec-02

Parameter	Result	Count Qual Error (2s)	Total Uncert(2 s)	MDC[MD	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 2325530	Work Orde	r: FDMN61AC	Report DE	ID: FDMN610	СМ			<u> </u>	<u> </u>			
CS-137	9.23E-01	1.4E-01	1.4E-01	7.22E-02 p	pCi/g					12/4/02 10:58 a	26.61	GAMMA_GS
					F	Rec Limits:	70.	130.			9	GER2\$1

Number of Results: 1

### **LCS RESULTS**

Lab Name:

STL Richland

SDG:

W03908

Lot-Sample No.: J2K210000-531

Report No.: 21240

Matrix: SOIL

Date: 20-Dec-02

Parameter	Result	Qual	Count Error ( 2 s)	Total Uncert(2 s)	MDCIMD	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 2325531	Work Ord	er: FDN	MPE1AC	Report DB	ID: FDMPE1	ıcs							
STRONTIUM	1.03E+00		1.3E-01	3.0E-01	1.31E-01	pCi/g	85.80%	1.14E+00	2.2E-02	90.12%	12/11/02 07:55 a	6.0	SRTOT_SEP_PRECIP
							Rec Limits:	70.	130.	-0.1		G	GPC32A

Number of Results: 1

Comments:

Bias

### **MATRIX SPIKE RESULTS**

Date: 20-Dec-02

Lab Name:

STL Richland

SDG:

W03908

Lot-Sample No.: J2K200322-1

**Report No.: 21240** 

Matrix: SOIL

Parameter	SpikeResult, Orig Rst	Qual	Count Error ( 2 s)	Total Uncert(2 s)	MDCIMD	Rpt Uni CRDL	•	Rec- overy	Exp- ected	Exp Uncert	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 2325532	Work Orde	er:		Report DB ID:	FDH5L1FS		Orig Sa DB ID:	9FDH5L10				<del></del>	
HEXCHROME	3.87E+01			0.0E+00	8.00E-02	mg/kg	N/A	93.91%	4.12E+01	l	12/4/02	2.5	EPA7196
	4.98E-01	RP	D 1.9									G	

Number of Results: 1

Comments:

RER

Bias



LS-038A, Rev. 9, 8/02

# Data Review Checklist RADIOCHEMISTRY First Level Review

First Level Review			$C \setminus$
-1 - · · ·			(1)
101/2013			
Lot Number: (12/(0030)			<del></del> _
Client ID: 13/1/2		<del></del>	
Due Date: 10/11/80	<del></del>	_ <del></del>	<del></del>
OC Batch Number: 232552			·
Method Test Parameter: 80-/2	·		
Matrix: SOIL,			
SDG Number: W350 Y			
Review Item	Yes (√)	No (√)	N/A (√)
A. COC			
1. Is the ICOC page complete (includes all applicable analysts, dates,	•		
SOP numbers and revisions)?	/		. [
B. QC Batch			7
1. Do the Summary/Detailed Reports include a calculated result for			
each sample listed on the QC Batch Sheet?	-	-	1 [
2. Are the QC appropriate for the analysis included in the batch?			
3. Is the Analytical Batch Worksheets complete (includes, as			
appropriate, volumes, count times, etc.)?	J	<u> </u>	_
4. Does the Worksheets include a Tracer Vial label for each sample?			
C. QC & Samples			
1. Is the blank result, yield and MDA within contract limits?		)	
2. Is the LCS result, yield and MDA within contract limits?	/		
3. Are the MS/MSD results, yields and MDAs within contract limits?		- /	
4. Are the duplicate results, yields and MDAs within contract limits?			
5. Are the sample yields and MDAs within contract limits?			
D. Raw Data			
1. Were results calculated in the correct units?	/	'	
2. Were analysis volumes entered correctly?			
3. Were yields entered correctly?		1	
4. Were spectra reviewed/meet contractual requirements?			
Were raw counts reviewed for anomalies?			
E. Other			7 /
. Are all Nonconformances included and noted?	<del> </del>		<del>                                      </del>
	/	{	, ,
. Are all required forms filled out?	<del></del>		<del> </del>   .
1. Are all Nonconformances included and noted? 2. Are all required forms filled out? 3. Was the correct methodology used? 4. Was transcription checked?			
2. Are all required forms filled out? 3. Was the correct methodology used?			

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Data Review Checklist
RADIOCHEMISTRY
Second Level Review

QC Batch Number: 2325527

Review Item	Yes (√)	No (V)	N/A (√)
A. Sample Analysis		1	
1. Are the sample yields within acceptance criteria?			1
2. Is the sample Minimum Detectable Activity < the Contract	1		
Detection Limit?	l		· <u>                                      </u>
3. Are the correct isotopes reported?	/		
B. QC Samples			
1. Is the Minimum Detectable Activity for the blank result; ≤ the		1	ļ
Contract Detection Limit?			<u> </u>
2. Does the blank result meet the Contract criteria?			
3. Is the blank result < the Contract Detection Limit?			
4. Is the blank result > the Contract Detection Limit but the sample			
result < the Contract Detection Limit?	<u> </u>		
5. Is the LCS recovery with contract acceptance criteria?	/		
7. Is the LCS Minimum Detectable Activity ≤ the Contract Detection			
Limit?	1 : /		
8. Do the MS/MSD results and yields meet acceptance criteria?		1	
9. Do the duplicate sample results and yields meet acceptance		1	
criteria?	<i>J</i> .		<u> </u>
C. Other	(		
1. Are all Nonconformances included and noted?	[	Ī	
2. Are all required forms filled out?			- N
3. Was the correct methodology used?			J
4. Was transcription checked?		T	
5. Were all calculations checked at a minimum frequency?	7,		
6. Were units checked?			Ţ

Comments on any "No"	response:	· .
·		
Second Level Review:	-showbusing	Date: 12/12/12



### Data Review Checklist RADIOCHEMISTRY

Yes (√)	No (V)	N/A (√)
	No (√)	N/A (\(\frac{1}{2}\)
	No (√)	N/A (√)
	No (√)	N/A (√)
	No (√)	N/A (√)
	No (√)	N/A (√)
	No (√)	N/A (√)
	No (√)	N/A (√)
	No (V)	N/A (√)
	No (V)	N/A (V)
<i>/ / / /</i>		
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1		

LS-038A, Rev. 9, 8/02

Date: 12-13-03

### SEVERN STL

Data Review Checklist
RADIOCHEMISTRY
Second Level Review

OC Batch Number:	_ 23	25520	<b>)</b>

Review Item	Yes (√)	No (V)	N/A (√)
A. Sample Analysis	<u> </u>		
1. Are the sample yields within acceptance criteria?			
2. Is the sample Minimum Detectable Activity < the Contract	T		T
Detection Limit?			<u> </u>
3. Are the correct isotopes reported?			
B. QC Samples			
<ol> <li>Is the Minimum Detectable Activity for the blank result ≤ the</li> </ol>			
Contract Detection Limit?			
2. Does the blank result meet the Contract criteria?	/		<u> </u>
3. Is the blank result < the Contract Detection Limit?		<u> </u>	<u></u>
4. Is the blank result > the Contract Detection Limit but the sample			
result < the Contract Detection Limit?		ļ	V
5. Is the LCS recovery with contract acceptance criteria?		ļ	<u> </u>
7. Is the LCS Minimum Detectable Activity ≤ the Contract Detection	1		t
Limit?		ļ	
8. Do the MS/MSD results and yields meet acceptance criteria?		ļ	<u> </u>
9. Do the duplicate sample results and yields meet acceptance		,	
criteria?		<del>}</del>	<del></del>
C. Other			1 ~
1. Are all Nonconformances included and noted?		<u> </u>	<del>-}</del>
2. Are all required forms filled out?		ļ <u>-</u>	<del></del>
3. Was the correct methodology used?		<del> </del>	<del> </del>
4. Was transcription checked?	/	<b></b>	<del></del>
5. Were all calculations checked at a minimum frequency?		<b>ļ.</b>	<del> </del>
6. Were units checked?		ì	1

. Were units checked?				}
Comments on any "No" res	ponse:			<u></u>
				<u></u> -
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Second Level Review:	nuntrigue	·	Date: 12/13/0	



LS-038A, Rev. 9, 8/02

### Data Review Checklist RADIOCHEMISTRY First Level Review

Client ID: BH=			··· <del>·</del>
Due Date: 12-11-02			<del></del>
OC Batch Number: 2325530			
Method Test Parameter: Gamma			···
Matrix: Sey			<del></del> -
SDG Number: wo3908			
000			<del></del>
Review Item	Yes (√)	No (V)	N/A (√)
A. COC		T	
1. Is the ICOC page complete (includes all applicable analysts, dates,			
SOP numbers and revisions)?	/		
B. QC Batch			
1. Do the Summary/Detailed Reports include a calculated result for	_		
each sample listed on the QC Batch Sheet?		1	
2. Are the QC appropriate for the analysis included in the batch?	V		<del>                                     </del>
3. Is the Analytical Batch Worksheets complete (includes, as		1	
appropriate, volumes, count times, etc.)?		1	1
4. Does the Worksheets include a Tracer Vial label for each sample?			
C. QC & Samples			
1. Is the blank result, yield and MDA within contract limits?			
2. Is the LCS result, yield and MDA within contract limits?	<del></del>		
3. Are the MS/MSD results, yields and MDAs within contract limits?	······································		
4. Are the duplicate results, yields and MDAs within contract limits?			<del> </del>
5. Are the sample yields and MDAs within contract limits?		<del>                                     </del>	·- <del> </del>
D. Raw Data		<del>                                     </del>	<del>- </del>
Were results calculated in the correct units?			
2. Were analysis volumes entered correctly?			
3. Were yields entered correctly?		<u> </u>	<del>                                     </del>
4. Were spectra reviewed/meet contractual requirements?		<del> </del>	<del> </del>
5. Were raw counts reviewed for anomalies?			+
E. Other			
1. Are all Nonconformances included and noted? 306766			
2. Are all required forms filled out?		<del> </del>	
B. Was the correct methodology used?			
4. Was transcription checked?		<del></del>	
5. Were all calculations checked at a minimum frequency?		<del> </del>	
5. Are worksheet entries complete and correct?	<del></del>	<del>                                     </del>	· <del> </del>
2 1 10 Workshoot charles complete and correct:		L	
Comments on any "No" response:			
Comments on any "No" response:		·	
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First Level Review:			



Data Review Checklist RADIOCHEMISTRY Second Level Review

OC Batch Number:	Z	325	53	30
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Review Item	Yes (√)	No (√)	N/A (√)	]
	169(4)	140 (4)	144 (4)	
A. Sample Analysis				
. Are the sample yields within acceptance criteria?	<del>                                     </del>		<del></del>	
2. Is the sample Minimum Detectable Activity < the Contract		1	1	
Detection Limit?		ļ <u>.</u>		
. Are the correct isotopes reported?	-	<u> </u>		
B. QC Samples		1		
. Is the Minimum Detectable Activity for the blank result ≤ the	İ	1		
Contract Detection Limit?		·		
2. Does the blank result meet the Contract criteria?				
3. Is the blank result < the Contract Detection Limit?				
4. Is the blank result > the Contract Detection Limit but the sample	ŀ			
esult < the Contract Detection Limit?				
i. Is the LCS recovery with contract acceptance criteria?				
7. Is the LCS Minimum Detectable Activity ≤ the Contract Detection				
Limit?		1		
B. Do the MS/MSD results and yields meet acceptance criteria?	<del></del>			
. Do the duplicate sample results and yields meet acceptance				
enteria?		ļ	( (	
C. Other			1 1	1
. Are all Nonconformances included and noted?			4 L	112 6
2. Are all required forms filled out?	<del> </del>	<del> </del>	<del></del> -	
B. Was the correct methodology used?		<del></del>	<del>-    </del>	
Was transcription checked?	<del>                                     </del>	<del></del>		
Were all calculations checked at a minimum frequency?			<del> </del>	
Were units checked?			<del></del>	
. Were units checked?	<u> </u>	<u> </u>		
Comments on any "No" response:		·		<u> </u>
			<del></del>	
<u> </u>				··· · · · · · · · · · · · · · · · · ·
Second Level Review	X/-	Date	12/12/0	, <del>Z</del> _
Second Level Review.		Date: _	10-11-10	
Second Level Review:	X	Date: _	12/12/0	, Z

### Clouseau **Nonconformance Memo**



NCM #: J06766

NCM Initiated By: Dale OConnell

Date Opened: 12/09/02

Date Closed: N/A

Classification: Anomaly

Status: **QAREVIEW** 

Production Area: Environmental - Prep

Tests: Gamma by GER

Lot #'s (Sample #'s): J2K200322 (1,2)

QC Batch: 2325530

Nonconformance: QC Result Out of Limits Subcategory: MDA exceeds RDL

### Problem Description / Root Cause

Name

**Date** 

**Description** 

Dale OConnell

12/09/02

Cause: Insufficient mass. Isotopes affected: Co-60, Eu-152,-154 and/or -155.

All requested radionuclides unavailable in geometry created.

### **Corrective Action**

<u>Name</u>

<u>Date</u>

**Corrective Action** 

Dale OConnell

12/09/02 Count time maximized, MDA achieved on the blank. Report results.

### **Approval History**

<u>Name</u>

**Date Approved:** 

**Position** 

Dale OConnell

12/09/02

Group Leader



Data Review Checklist RADIOCHEMISTRY

1. Is the ICOC page complete (includes all applicable analysts, dates, SOP numbers and revisions)?  B. QC Batch 1. Do the Summary/Detailed Reports include a calculated result for each sample listed on the QC Batch Sheet? 2. Are the QC appropriate for the analysis included in the batch? 3. Is the Analytical Batch Worksheets complete (includes, as appropriate, volumes, count times, etc.)? 4. Does the Worksheets include a Tracer Vial label for each sample?  C. QC & Samples 1. Is the blank result, yield and MDA within contract limits? 2. Is the LCS result, yield and MDAs within contract limits? 3. Are the MS/MSD results, yields and MDAs within contract limits? 4. Are the duplicate results, yields and MDAs within contract limits? 5. Are the sample yields and MDAs within contract limits? 6. Were results calculated in the correct units? 6. Were analysis volumes entered correctly? 6. Were yields entered correctly? 7. Were spectra reviewed/meet contractual requirements? 8. Were raw counts reviewed for anomalies? 8. Other 9. Are all Nonconformances included and noted? 9. Are all required forms filled out? 9. Was transcription checked? 9. Was transcription checked? 9. Were all calculations checked at a minimum frequency?	Lot Number: Jakawaaa Client ID: Due Date: OC Batch Number: Method Test Parameter: Matrix: SDG Number:  Review Item  A. COC 1. Is the ICOC page complete (includes all applicable analysts, dates, SOP numbers and revisions)?  B. QC Batch 1. Do the Summary/Detailed Reports include a calculated result for each sample listed on the QC Batch Sheet? 2. Are the QC appropriate for the analysis included in the batch? 3. Is the Analytical Batch Worksheets complete (includes, as	Yes (√)	No (V)	P
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. Are worksheet entries complete and correct?	2. Are all required forms filled out?  3. Was the correct methodology used?  4. Was transcription checked?  5. Were all calculations checked at a minimum frequency?  6. Are worksheet entries complete and correct?			

LS-038A, Rev. 9, 8/02



### Data Review Checklist **RADIOCHEMISTRY** Second Level Review

Review Item	Yes (√)	No (√)	N/A (√)
A. Sample Analysis	\ . /	1	- <del>  -   -   -   -   -   -   -   -   -  </del>
Are the sample yields within acceptance criteria?			
2. Is the sample Minimum Detectable Activity < the Contract	<del>                                     </del>		<del></del>
Detection Limit?		ļ	
3. Are the correct isotopes reported?			
B. QC Samples	<del></del>	<del> </del>	
1. Is the Minimum Detectable Activity for the blank result ≤ the			-
Contract Detection Limit?		}	
2. Does the blank result meet the Contract criteria?		· · · · · · · · · · · · · · · · · · ·	
3. Is the blank result < the Contract Detection Limit?			
4. Is the blank result > the Contract Detection Limit but the sample	1		
result < the Contract Detection Limit?			
5. Is the LCS recovery with contract acceptance criteria?			
7. Is the LCS Minimum Detectable Activity ≤ the Contract Detection			
Limit?	<u> </u>	ļ	l
B. Do the MS/MSD results and yields meet acceptance criteria?			
9. Do the duplicate sample results and yields meet acceptance			
criteria?		<u> </u>	1
C. Other		-	
1. Are all Nonconformances included and noted?			
2. Are all required forms filled out?			
3. Was the correct methodology used?			
4. Was transcription checked?			
5. Were all calculations checked at a minimum frequency?			
5. Were units checked?			
Comments on any "No" response:			
		<u></u>	
		<del></del>	

### SEVERN TRENT

SERVICES

Richland Laboratory
Data Review Check List
METALS

Data Review Check L METALS

Work Order Number(s): FDH5D, FDH59				
Lab Sample Numbers or SDG: W03908 232553	32			
Method/Test/Parameter: Cr + W in Soil RICHWC 500F	Rb			
Review Item	Yes (✓)	No (✓)	N/A (✓)	2 <sup>nd</sup> Level Review (✓)
A. Initial Calibration	/			
1. Performed at required frequency with required number of levels?	<u> </u>			
2. Correlation coefficient within QC limits?	V			
Initial calibration verification (ICV) analyzed immediately after calibration and results within QC limits?	V			
4. Initial calibration blank(ICB) analyzed immediately after ICV and concentrations of all parameters ≤ reporting limit?	/			
B. Continuing Calibration				
1. CCV analyzed at required frequency and all parameters within QC limits?	V			
2. CCB analyzed at required frequency and all results ≤ reporting limit?	V			
C. Sample Analysis				
Were any samples with concentrations above the linear range for any parameter diluted and reanalyzed?	~			
2. Were all sample holding times met?	V			
D. QC Samples				
1. All results for the preparation blank below limits?	<b>√</b>			
2. MS or MS/MSD recoveries within QC limits and %RPD (for MSD) acceptable?	V			V
3. LCS percent recovery within QC limits and %RPD (for LCSD) acceptable?	V			~
4. Analytical spikes within QC limits where applicable?	V			V
5. ICP only: One serial dilution performed per SDG?			V	/
6. ICP only: CRDL standard (CRI or CRA) analyzed at required frequency?			V	~
7. ICP only: Interference check samples (ICSA, ICSAB) and HICAL analyzed at the required frequencies and within QC limits?			V	/

Review Item	Yes (✓)	No (✓)	N/A (✓).	2 <sup>nd</sup> Level Review (✓)
E. Other				
1. Are all nonconformances included and noted?			V	
2. Is the correct date and time of analysis shown?	V			/
3. Did the analyst sign and date the front page of the analytical run?	V			/
4. Correct methodology used?	V		<del></del>	/
5. Transcriptions checked?	V			/
6. Calculations checked at minimum frequency?	. V		<u> </u>	V
7. Units checked?	V			/

Comments on any "No" response:			
	7		
	<del></del>		
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Analyst: Diggins 2011	_		Date: 10/5/08
Second-Level Review:	<del>- u</del>		Date: 12-13-02

Form No. CG-191, Rev. 3, 12/01



Data Review Checklist

RADIOCHEMISTRY

Second Level Review

Review Item	Yes (√)	No (1)	N/A (√)
A. Sample Analysis	T		
1. Are the sample yields within acceptance criteria?	-		
2. Is the sample Minimum Detectable Activity < the Contract	Ţ		
Detection Limit?	l	·	
3. Are the correct isotopes reported?			
B. QC Samples			
<ol> <li>Is the Minimum Detectable Activity for the blank result ≤ the</li> </ol>			
Contract Detection Limit?			1
2. Does the blank result meet the Contract criteria?		<u> </u>	
3. Is the blank result < the Contract Detection Limit?			
4. Is the blank result > the Contract Detection Limit but the sample	<u> </u>	l	1 /
esult < the Contract Detection Limit?			1
5. Is the LCS recovery with contract acceptance criteria?		<u> </u>	
7. Is the LCS Minimum Detectable Activity ≤ the Contract Detection	}	1	
-imit?			1
. Do the MS/MSD results and yields meet acceptance criteria?			<del> </del>
Do the duplicate sample results and yields meet acceptance			
riteria?	<b>V</b>	<del> </del>	<del> </del>
C. Other	1	1	
. Are all Nonconformances included and noted?	<u> </u>	<u> </u>	
. Are all required forms filled out?		<u> </u>	<del></del>
. Was the correct methodology used?		<del> </del>	<del> </del>
. Was transcription checked?	/_/_	ļ	<del> </del>
. Were all calculations checked at a minimum frequency?	<del>                                     </del>	<u></u>	
. Were units checked?		<u>L</u>	<u> </u>

37

Second Level Review:

### CHAIN OF CUSTODY

Bechtel Hanford Inc.	CE	IAIN OF CUST	ODY/S	SAMPL	E ANALY	SIS	REQUE	ST	В0	0-030-073	Page 1	of 1
Collector MT Stankovich   Fahlber	Compa	ny Contact Stankovich	Telepho 531-7	ne No.			Project Coo TRENT, SJ		Price Code	8L		naround
Project Designation 100 F Area - Full Protocol		ng Location F-6 Deep Zone Verificati	on				SAF No. B00-030		Air Qualit	y 🗆	21 ]	Days
Ice Chest No. F.F.C 01.063	Field L	ogbook No. 1535-7		COA R116F62	2000		Method of S Hand Delic		t Vehicle			
Shipped To Severn Trent Incorporated, Richland	Offsite	Property No.	P			-	Bill of Ladia	g/Air Bill	No. NA			
POSSIBLE SAMPLE HAZARDS/REMARKS	<u> </u>	<u>-</u>	ľ	1								
Radioactive TIRTO JOO 4n	1/	Preservation	Cool 4C	None	None	Non	e					
Special Handling and/or Storage		Type of Container	aG 1	P	aG 1	P					_	
Coolyc		No. of Container(s)	60mL	1000mL		20m	L	-		<u> </u>	<u></u>	<u> </u>
		Volume	Chromium	See item (1)	in Strontium-	Activity	Scan					
SDG SAMPLE ANALYSIS	he la	2-11-02	Hex - 7196	Special Instruction	89,90 Total							
W03908 ()2K	(200	322			10-29-02		į					
Sample No. Matrix *	Sample Date	Sample Time	E/0.7/2				S 4 2				E. HAS	
JOOBD9 FDH5L SOIL 1	1.20.0	72-0925	×	X	×	Ż						<u> </u>
			i	l							<u> </u>	
	···											
CHAIN OF POSSESSION	Sign/Print	l Names			ECIAL INSTR	UCTIO	NS		<u> </u>			Matrix *
	ectived By/Store	A Rhineheart I	ate/Time	4:29 (1)	) Germana Spectros	сору {Се	esium-137, Coba	t-60, Europii	m-152, Europium	-154, Europium-	155}	S=Soil SB=Sodien=nt SO=Solid El=Shudge W = Water O=Oil A=Air
Relinquished By/Removed From Date/Time R	eccived By/Store	ed In D	ate/Time									D8=Drum Solida DL=Drum Liquida T=Tiesse
Relinquished By/Removed From Date/Time R	eceived By/Store	ed in D	ete/Time									WI=Wipe L/-Liquid V=Vegetation
Relinquished By/Removed From Date/Time R	eceived By/Ston	ed In D	nte/Time									X=Other
Relinquished By/Removed From Dete/Time R	eceived By/Stor	red In D	ete/Time								3.4. <i>m</i> :	
LABORATORY Received By SECTION				itle							Date/Time	
FINAL SAMPLE Disposal Method DISPOSITION					Dispo	sed By		<del></del> -		1	Date/Time	

Bechtel Hanford	d Inc.	CI	HAIN OF CUST	ODY/S	AMPLE	E ANAL'	YSIS	RE	EQUEST	'	B00-	030-071	Page 1	of 1
Collector MT Stankovich (Foult		Compa	ny Contact e Stankovich	Telephor 531-7	ne No.			Proj	ject Coordin ENT, SJ	ator Pi	rice Code	8L	Data Tur	
Project Designation 100 F Area - Full Protocol			ing Location -F-35 Verification					SAF B00-	F No. 0-030	Ai	r Quality		21 1	Days
Ice Chest No.	01.063		ogbook No. 1535-7		COA R10F3520	00			thod of Ships Iand Delieven		hicle			
Shipped To Severn Trent Incorporated, Rick		Offsite	Property No.	<i> </i>				BiO	of Lading/A	ir Bill No.	NA			
POSSIBLE SAMPLE HAZAR	DS/REMARKS		,											
Radioactive TIC T	a J 20 863		Preservation	Cool 4C	None	None	Nor		None					
   Special Handling and/or St	torage	1	Type of Container	aG	P	aG	*G		P					
	c00/4c		No. of Container(s)	1	1 1000 7	1	ļ		20mL					
			Volume	60mL	1000mL	60mL	60m	ı	ZOHIL .					
	SAMPLE ANALYS	is		Chromium Hex - 7196	See item (1) in Special Instructions.	Isotopic Phytorium; Isotopic Uranium; Americium-24 l	Stronti 89,90 – Sr,		Activity Scan					
Sample No.	Matrix *	Sample Date	Sample Time				16 A						是好的	***
J008D0 FDH59	SOIL	1.20	0830	X	X	X		ς .	Х		ļ	_		
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							<b> </b> -	_			ļ			
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				1	1	<u> </u>								Matrix *
CHAIN OF POSSESSIO Relinquished By/Removed From Relinquished By/Removed From	Date/Time	Received By/Stor	red In	ate/Time	(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	CIAL INSTR			-137, Cobalt-60,	Europium-1	52, Europium-15	54, Europium-l	55}	S-Soil SB-Sediment SO-Soild SI-Studge W = Water O-Oil A-Air
Relinquished By/Removed From  Relinquished By/Removed From	Date/Time	Received By/Stor		ate/Time										DE=Drum Solida DL=Drum Liquida T=Tiense W[=Wipe
Relinquished By/Removed From	Date/Time	Received By/Sto	red In D	ste/Time										L=Liquid V=Vegetation X=Other
Relinquished By/Removed From	Detc/Time	Received By/Sto	red In D	ste/Time										
LABORATORY Received By SECTION	,	<u> </u>		T	itle		-					D	ate/Time	
FINAL SAMPLE Disposal Me	ethod					Dispo	sed By					D	ate/Time	

116-6-16

VMS Gamma Spectroscopy Report generated 16-SEP-2002 14:32:11

: DKA100: [GAMMA.SCUSR.ARCHIVE] SMP\_RCF10490\_DET1\_750ML9001360\_7 : J004M1 Project Number : I16-F-6 Configuration Sample ID : RCF10490 RFC Number SAF Number : B00-029

: 1.17700E+03 GRAMS

Sample Quantity Sample Type : Soil Sample Geometry

Sample Date : 12-SEP-2002 08:20:00 Acquisition date : 16-SEP-2002 14:01:51 4 05:41:51.85 f dead time Decay time : 0.0%

Elapsed live time: 0 00:30:00.00 Elapsed real time: 0 00:30:00.76 Energy cal. time: 14-FEB-2002 16:05:03 Effic. cal. time: 3-APR-2002 13:21:12.

: BEGE 3820 Detector name Counting geometry: 750 ml >900<1360 Peak Sensitivity: 3.00000

Efficiency Type : EMPIRICA Energy tolerance: 2.00000

Combined Activity-MDA Report

#### ---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act error	MDA (pCi/GRAM)	MDA error	Act/MD
K-40 CO-60 CS-137 EU-152 EU-154 EU-155 TL-208 PB-212 PB-214 AC-228 TH-234 U-235	1.663E+01 2.126E-01 1.827E+00 3.183E+00 3.103E-01 4.651E-03 1.541E-01 5.501E-01 5.815E-01 4.299E-01 7.642E-01 8.327E-02	2.139E+00 5.157E-02 2.242E-01 2.277E-01 7.589E-02 7.265E-02 8.201E-02 1.003E-01 1.151E-01 3.128E-01 5.515E-01 6.568E-02	4.678E~01 5.732E-02 7.257E-02 1.248E-01 9.056E-02 1.233E-01 6.502E-01 9.942E-02 1.200E-01 0.000E+00 9.307E-01 6.393E-02	4.430E-02 5.234E-03 7.011E-03 1.468E-02 8.926E-03 1.353E-02 6.318E-02 1.093E-02 1.185E-02 0.000E+00 3.860E-01 6.239E-03	35.54: 3.70: 25.18: 25.51: 3.42: 0.03: 0.23: 5.53: 4.84: 0.000 0.821

#### ---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity K.L. (pCi/GRAM) Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
BI-212	3.943E-01	6.736E-01	1.068E+00	1.155E-01	0.369
BI-214	5.423E-01 +	1.688E-01	2.272E-01	2.319E-02	2.387
RA-226	1.224E+00 +	1.176E+00	1.313E+00	1.179E-01	0.932
AM-241	5.864E-02	7.127E-02	1.239E-01	1.439E-02	0.473
	1100				4.1.2.1.2

Approved by: Approval Date: 9 / 17 / Q

mma Spectroscopy Report generated 4-NOV-2002 09:45:02

: DKA100: [GAMMA.SCUSR.ARCHIVE] SMP\_RCF10608\_DET1\_50GRAMPILLBOX60 *iguration* : 100-F-35 J00863 Project Number ble ID : RCF10608 SAF Number : B00-029 Number : 6.70000E+01 GRAMS ample Quantity sample Type Sample Geometry : Soil : 31-OCT-2002 08:15:00 Acquisition date : 4-NOV-2002 08:44:46. Sample Date % dead time ; 0.0% Decay time 4 00:29:46.65 Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.14 Energy cal. time: 14-FEB-2002 16:05:03 Effic. cal. time: 4-APR-2002 08:08:29. Counting geometry: 50Gram pill box : BEGE 3820 Detector name

Peak Sensitivity: 3.00000 Efficiency Type: EMPIRICA Energy tolerance: 2.00000

Combined Activity-MDA Report

#### ---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
K-40 CS-137 EU-155 TL-208 BI-212 PB-212 PB-214 AC-228 TH-234 AM-241	1.441E+01 4.730E-01 2.410E-02 2.013E-01 2.124E+00 6.016E-01 6.617E-01 6.474E-01 9.832E-01	4.216E+00 1.727E-01 7.948E-02 1.688E-01 1.707E+00 1.496E-01 2.491E-01 4.721E-01 5.487E-01	2.890E+00 1.340E-01 1.335E-01 1.970E+00 2.285E+00 2.249E-01 2.636E-01 0.000E+00 7.355E-01 9.839E-02	2.868E-01 1.529E-02 1.561E-02 2.168E-01 2.825E-01 2.585E-02 2.679E-02 0.000E+00 3.098E-01 1.371E-02	4.987 3.531 0.181 0.102 0.929 2.674 2.510 0.000 1.337 0.482

#### ---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
CO-60	2.152E-02		1.298E-01	2.739E-01	2.653E-02	0.079
EU-152	8.745E-02	+	1.357E-01	1.822E-01	2.902E-02	0.480
EU-154	6.377E-02	+	9.889E-02	1.115E-01	1.620E-02	0.572
BI-214	6.201E-01	+	3.218E-01	6.607E-01	7.583E-02	0.939
RA-226	4.734E-01		1.117E+00	2.120E+00	1.892E-01	0.223
Ŭ-235	3.071E-02		6.477E-02	1.232E-01	1.196E-02	0.249
			· ·			

Approved by:

Approval Date: 11 / 4 / 6

TIMOTHY J. SNIDER



### Sample Check-in List

Date/T	ime Received: 1	(20/02@14:27 O	ie.	
Client:	~ 1 ~	SDG #: W03	908 <sub>na[]</sub> saf#: <u>(</u>	300-030 NA[]
Work C	Order Number:	<u> </u>		0-030-071,-073
Shippin	g Container ID:_	ERC-01-063	Air Bill # \(\sum_{Air}\)	·
1.	Custody Seals or	shipping container intact?	NA [	] Yes [X No []
2.	Custody Seals da	nted and signed?	NA [	] Yes [ No [ ]
3.		y record present?		Yes [ No [ ]
4.	Cooler temperate	re: 40 NA[] 5.V	ermiculite/packing materi	als is NA[] Wet[] Dry
6.	Number of samp	les in shipping container:	9	
7.	Sample holding t	imes exceeded?	NA	Yes [] No []
8.	Samples have:tapecustody se	als	hazard labe	els samples labels
9.	Samples are:in good conbroken	ndition	leaking have air bu (Only for samples	bbles s requiring head space)
10.	Sample pH taken	?	NA (V	pH<2[] pH>2[]
11.		, Sample Collector Listed? *ion only. No corrective acti		Yes [ No [ ]
12.	Were any anomal	lies identified in sample rece	eipt?	Yes [] No []
13.	Description of an	omalies (include sample nu	mbers):	
				······································
Sample	Custodian: O. Al.	O Rhiertrand / Rich	Dal Date: 1120/06	2
Clie	nt Sample ID	Analysis Requested	Condition	Comments/Action
Client Inf	ormed on	by	Person contacted	
[ ] No a	ction necessary; pro	ocess as is.		
Project M	anager	****	Date	
LS-023, 9	01, Rev. 4			

12/6/02 9:26:01 AM		Sample Pre	paration/Ana	alysis		Balance Id:1120373	3922
127642, BECHTEL HANFORD, INC.		PuAm PrpRC5013/RC		)(5003)/RC5010(	5039)	Pipet #:	
Bechtel Hanford, Inc.		Plutonium-238,239/40	by Alpha Spec	Di		•	
Report Due: 12/11/2002 W03	900 51	CLIENT: HANFORD		P	RIORITY	DI/IM Tech:	
Batch: 2325527 SOIL	pCi/g	PM,	Quote: BG1, 27	038	Se	p2 DT/Tm Tech:	
SEQ Batch, Test: 2325528, 6ISX 2325528	, 6ISX					Prep Tech: ,WAGN	IERJ
Work Order, Lot, Sample DateTime Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	QC Vial 2 Prep Date	Count Time Min	Detector Id	Count On   Off (24hr) Circle	CR Analyst, Init/Date
1 FDH59-1-AE	2.0g,in	PATB2612			-	· ·	
J2K200322-2-SAMP		11/06/02 09/30/02_r		260 	****		
11/20/2002 08:30	AmtRec: LP,3X60	G,20ML #Containers: 5			Scr Rst:	Alpha: 9.47E+00 pCi/g	Beta: 2.39E+01 pCi/g
2 FDH59-1-AJ-X	1.94g,in	PATB2613			·····		
J2K200322-2-DUP		11/06/02 09/30/02.r					
11/20/2002 08:30	AmtRec: LP,3X60	G,20ML #Containers: 5			Scr Rst:	Alpha: 9.47E+00 pCi/g	Beta: 2.39E+01 pCi/g
3 FDMNN-1-AA-B	2.0g,in	PATB2614					
J2K210000-527-BLK		11/06/02 09/30/02 <sub>.</sub> r					
11/20/2002 08:30	AmtRec:	#Containers: 1			Scr Rst:	Alpha:	Beta:
4 FDMNN-1-AC-C	2.0g,in	PUSK0505					
J2K210000-527-LCS		09/20/02 Ω5/31/02.r				***************************************	
11/20/2002 08:30	AmtRec:	#Containers: 1	_		Scr Rst:	Alpha:	Beta:
5 FDMNN-1-AD-BX	2.03g,in	PATB2615					
J2K210000-527-MBLK		11/06/02 09/30/02_r					
11/20/2002 08:30	AmtRec:	#Containers: 1			Scr Rst:	Alpha:	Beta:
6 FDMNN-1-AE-CM	2.0g,in	PUSK0504					
J2K210000-527-MLCS		09/20/02 05/31/02.r		<u> </u>			
11/20/2002 08:30	AmtRec:	#Containers: 1			Scr Rst:	Alpha:	Beta:
42							
4							
-	fi - Final Amt, di - Diluted A		Page 1	· · · · · · · · · · · · · · · · · · ·			WO Cnt: 6 Prep_SamplePrep v4.6
Richland Wa. r - Reference dat	e, ec-Enrichment Cell, ct-C	ocktailed Added	. ago i				ггер_затріегтер v4.0

12/6/02 9:26	:02 AM			Sample Preparation/Analysis					Balance	ld:112037392	22
				6l PuAm Prp SO Plutonium		019, SepRC5080	(5003)/RC5010(	5039)	Pipe	t #:	
Report Due	: 12/11/2002			51 CLIENT: H	-	y Aiplia Spec	P	RIORIT	Map IDT/Tm Te	ch:	
Batch: 2325	527	ŗ	ci/g			·	<u>B.</u>		្រ ep2 DT/Tm Te		
SEQ Batch, Te	st: None								·	ch: ,WAGNEI	RJ
Work Order Sample Date		Total Amt/Unit	Initial Aliq Amt/Unit		Tracer ep Date	QC Vial 2 Prep Date	Count Time Min	Detector Id	Count On (24hr) Cir		CR Analyst, Init/Date
All Clients	i 2 · c	ewa Sai		d for	QC sav	mples #5	S FUMA	· /-/\D			MNN-1-AE-CM
127642,	BECHTEL HANF	ORD, INC.		Bechte	l Hanford,	inc. ,	BG1, 27038			•	
	P Constituen										· · · · · · · · · · · · · · · · · ·
PU-238	RDL:1	pCi/g	LCL:	UCL:	RPD:	PU-239	RDL:1	pCi/g	LCL:70	UCL:130	RPD:35
Pu-242 FDMNN1AA-BLK	RDL:	pCi/g	LCL:20	UCL:105	RPD:35						
PU-238	RDL:1	pCi/g	LCL:	UCL:	RPD:	PU-239	RDL:1	pCi/g	LCL:	UCL:	RPD:
Pu-242	RDL:	pCi/g	LCL:20	UCL:105	RPD:35	00 202		<b>P</b> , <b>P</b>		-	
FDMNN1AC-LCS	:										
PU-239	RDL:1	pCi/g	LCL:70	UCL:130	RPD:35	Pu-242	RDL:	pCi/g	LCL:20	UCL:105	RPD:35
FDMNN1AD-MBL	v.										
PU-238	RDL:1	pCi/g	LCL:	UCL:	RPD:	PU-239	RDL:1	pCi/g	LCL:	UCL:	RPD:
Pu-242	RDL:	pCi/g	LCL:20	UCL:105	RPD:35						
PDMNN1AE-MLC	S:										
PU-239	RDL:1	pCi/g	LCL:70	UCL:130	RPD:35	Pu-242	RDL:	pCi/g	LCL:20	UCL:105	RPD:35

45

FDMNN1AC-LCS:

FDMNN1AD-MBLK:

FDMNN1AE-MLCS:

Richland Wa.

Uncert Level (#s).: 2

Uncert Level (#s).: 2

Uncert Level (#s).: 2

STL Richland Key: In - Initial Amt, fi - Final Amt, di - Diluted Amt, s1 - Sep1, s2 - Sep2

r - Reference date, ec-Enrichment Cell, ct-Cocktailed Added

Decay to SaDt: Y

Decay to SaDt: Y

Decay to SaDt: Y

WO Cnt: 6
Prep\_SamplePrep v4.6

Sci.Not.: Y

Sci.Not.: Y

Sci.Not.: Y

Blk Subt.: N

Blk Subt.: N

Blk Subt .: N

ODRs: B

ODRs: B

ODRs: B

12/16/02 8:08:28 AM

### ICOC Fraction Transfer/Status Report ByDate: 11/16/02, 12/17/02, Batch: '2325527', User: 'All Order by BatchNbr,WorkOrderNbr,DateTimeAccepting

Q Batch V	Vork Ord CurStatus	; А	ccepting		Comments
2325527					
AC	CalcC	WAGNERJ	12/3/02 9:25:51	I AM	
SC		WagarR	IsBatched	11/21/02 3:10:30 PM	ICOC_RADCALC v4.5.3.2
SC		WAGNERJ	InPrep2	12/3/02 9:25:51 AM	RICH-RC-5019 REVISION 2
SC		WAGNERJ	Prep2C	12/6/02 2:36:18 PM	RICH-RC-5019 REVISION 2
SC		HAMMERL	InSep1	12/9/02 8:07:49 AM	RICH-RC-5080 REVISION 1
SC		BlackCL	InCnt1	12/13/02 10:12:26 AM	RICH-RD-0008 REVISION 2
SC		BlackCL	CalcC	12/14/02 9:02:23 AM	RICH-RD-0008 REVISION 2
AC		WAGNERJ	12/6/02 2:36:18	3 PM	
AC		HAMMERL	12/9/02 8:07:49	9 AM	
AC		BlackCL	12/13/02 10:12	:26	
AC		BlackCL	12/14/02 9:02:2	23 AM	

12/6/02 9:34:22 AM			Samp	ple Pre	paration/Ana	alysis			Balance Id:112037	73922
127642, BECHTEL HANFORD,	INC.		•		19, SepRC5079(	5039)			Pipet #:	
Bechtel Hanford, Inc.	10290		Uranium-234,		by Alpha Spec			PRIORJ.	of DT/Tm Tech:	
Report Due: 12/11/2002 \			OLIENT. BAN							
Batch: 2325529 SOIL	p(	Ci/g		РМ, (	Quote: BG1, 27	038		Se	p2 DT/Tm Tech:	
SEQ Batch, Test: None									Prep Tech: ,WAG	NERJ
Work Order, Lot, Tot Sample DateTime Amt/1	- 11	Initial Aliquot Amt/Unit	QC Tra	11	QC Vial 2 Prep Date	Coun Time I		Detector Id	Count On   Off (24hr) Circle	CR Analyst, Init/Date
1 FDH59-1-AC		1.98g,in	UITC8374	-: -: -: -: -: -: -: -: -: -: -: -: -: -		_	_		·	
J2K200322-2-SAMP			11/13/02 10/05/02 <i>1</i>			30				
11/20/2002 08:30		AmtRec: LP,3X6	•	ontainers: 5				Scr Rst:	Alpha: 9.47E+00 pCi/g	Beta: 2.39E+01 pCi/g
2 FDH59-1-AL-X		1.92g,in	UITC8375			1				
J2K200322-2-DUP			11/13/02 10/05/02,r_							
11/20/2002 08:30		AmtRec: LP,3X6	OG,20ML #Co	ontainers: 5				Scr Rst:	Alpha: 9.47E+00 pCi/g	Beta: 2.39E+01 pCi/g
3 FDMN0-1-AA-B		2.0g,in	UITC8376			]				
J2K210000-529-BLK			11/13/02 10/05/02,r_							
11/20/2002 08:30		AmtRec:	#Containers	s: 1				Scr Rst:	Alpha:	Beta:
4 FDMN0-1-AC-C		2.0g,in	UISH0153		•	[	,			
J2K210000-529-LCS			10/13/02 05/06/02 <sub>,r</sub> _			·····				
11/20/2002 08:30		AmtRec:	#Containers	s: 1				Scr Rst:	Alpha:	Beta:
Comments: Samples Samples	#4 FO were	muffle MNO-1-A convert	d overni c-c wa: ed 3x w	ign+.  s +ipg  s/ cor	12-06-02 ped and HCI. 12-0	GER 105+ 1 6-02	∙ 10% GEK	Scr Rst:	Z GEK	
All Clients for Batch: 127642, BECHTEL HANFORD,	INC.		Bechtel H	anford,	Inc.	BG1, 21	7038			
PDH591AC-SAMP Constituent Li U-232 RDL:	st: pCi/g	LCL:20	UCL:105	RPD:35	U-234	RDL:		pCi/g	LCL: UCL:	RPD:
U-235 RDL:1	pCi/g	LCL:	UCL:	RPD:	U-238	RDL:	L	pCi/g	LCL: UCL:	RPD:
FDMN01AA-BLK: U-232 RDL: U-235 RDL:1	pCi/g pCi/g	ICL:20 ICL:		RPD:35 RPD:	บ-234 บ-238	RDL:		pCi/g pCi/g	LCL: UCL:	RPD: RPD:
		Amt, di - Diluted			Page 1		-		-	WO Cnt: 4 Prep_SamplePrep v4.

1	2/6	/02	9.3	4:23	AM
•		UL	$\omega$ . $\omega$	7.60	/ NIVI

### Sample Preparation/Analysis

7S Ulso PrpRC5013/RC5019, SepRC5079(5039) SR Uranium-234,235,238 by Alpha Spec

51 CLIENT: HANFORD

Balance	ld:1120373922

PRIORITY Pipet #: \_

Report Due: 12/11/2002 Batch: 2325529

SEQ Batch, Test: None

pCi/g

ρ¢

Sep2 DT/Tm Tech:

Prep Tech: WAGNERJ

Work Order, Lot, Sample DateTime	Total Amt/Unit	Initia! Aliquo Amt/Unit	ot QC Tracer Prep Date	QC Vial 2 Prep Date	Count Time Min	Detector Id	Count On   Off (24hr) Circle	CR Analyst, Init/Date
DMN01AC-LCS: U-232 RDL:	pCi/c	LCL:20	UCL:105 RPD:35	Uranium	RDL:	pCi/g	LCL:70 UCL:130	RPD:35
DH591AC-SAMP Calc : Uncert Level (	<del>-</del> -	y to SaDt: Y	Blk Subt.: N S	ci.Not.: Y O	Rs: B			
Uncert Level (	#s).: 2 Deca	y to SaDt: Y	Blk Subt.: N S	ci.Not.: Y O	Rs: B			
DMN01AC-LCS: Uncert Level (	#s).: 2 Deca	y to SaDt: Y	Blk Subt.: N S	ci.Not.: Y OI	Rs: B			

12/13/02 11:47:01 AM

## M ICOC Fraction Transfer/Status Report ByDate: 11/13/02, 12/14/02, Batch: '2325529', User: 'All Order by BatchNbr,WorkOrderNbr,DateTimeAccepting

Q Batch Wor	k Ord CurStat	tus Ac	cepting		Comments
2325529		· -			
AC	CalcC	BELSITOB	11/27/02 3:29:	50 PM	
SC		WagarR	IsBatched	11/21/02 3:08:49 PM	ICOC_RADCALC v4.5.3.2
SC		BELSITOB	inPrep	11/27/02 3:29:50 PM	RICH-RC-5013 REVISION 4
SC		BELSITOB	Prep1C	12/2/02 2:48:39 PM	RICH-RC-5013 REVISION 4
SC		WAGNERJ	InPrep2	12/3/02 9:26:18 AM	RICH-RC-5019 REVISION 2
SC		WagarR	Prep2C	12/6/02 9:41:14 AM	RICH-RC-5019 REVISION 2
SC		WAGNERJ	Prep2C	12/6/02 9:41:44 AM	RICH-RC-5019 REVISION 2
SC		HAMMERL	InSep1	12/9/02 8:06:18 AM	RICH-RC-5079 REVISION 1
SC		HAMMERL	Sep1C	12/10/02 7:07:40 AM	RICH-RC-5079 REVISION 1
SC	•	McPHERONC	InSep2	12/10/02 7:09:04 AM	RICH-RC-5039 REVISION 3
SC		McPHERONC	Sep2C	12/11/02 11:38:09 AM	RICH-RC-5039 REVISION 3
SC		BlackCL	InCnt1	12/11/02 12:17:49 PM	RICH-RD-0008 REVISION 2
SC		BlackCL	CalcC	12/12/02 9:12:12 AM	RICH-RD-0008 REVISION 2
AC		BELSITOB	12/2/02 2:48:39	9 PM	
AC		WAGNERJ	12/3/02 9:26:18	B AM	
AC		WagarR	12/6/02 9:41:14	4 AM	•
AC		WAGNERJ	12/6/02 9:41:44	4 AM	Please remove WagarR. JW
AC		HAMMERL	12/9/02 8:06:18	3 AM	
AC		HAMMERL	12/10/02 7:07:4	40 AM	
AC		McPHERONC	12/10/02 7:09:0	D4 AM	
AC		McPHERONC	12/11/02 11:38	:09	
AC		BlackCL	12/11/02 12:17	:49 PM	
AC		BlackCL	12/12/02 9:12:	12 AM	

11/21/2002 3:08:58 PM	1	1/21/	2002	3:08:58	PM
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### Sample Preparation/Analysis

Balance Id:

Pipet #:			
ripet #:			

Report Due: 12/11/2002

AX Gamma PrpRC5013/5017
TA Gamma by HPGE
5! CLIENT: HANFORD

PRIORITY Sep1 DT/Tm Tech:

Batch: 2325530

pCi/g

Sep2 DT/Tm Tech:

SEQ Batch, Test: None

Prep Tech:

Work Order, Sample Date	' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' '	it	Initial Aliquot Amt/Unit	QC Tracer Prep Date	QC Vial 2 Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On   Off (24hr) Circle	CR Analyst, Init/Date
Eu-155	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:						
DMN61AA-MBL	K:										
Co-60	RDL:5.00E-02	pCi/g	LCL:	UCL:	RPD:	Cs-137	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:
Eu-152	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:	Eu-154	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:
Eu-155	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:						
DMN61AC-MLC	S:										
Cs-137	RDL:0.1	pC1/g	LCL:70	UCL:130	RPD:35	K-40	RDL:	pCi/g	LCL:70	UCL:130	RPD:35
Ra-226	RDL:0.1	pCi/g	LCL:70	UCL:130	RPD:35	RA-228	RDL:0.2	pCi/g	LCL:70	UCL:130	RPD:35
RA-228DA	RDL:0.2	pCi/g	LCL:70	UCL:130	RPD:35	U-238	RDL:	pCi/g	LCL:70	UCL:130	RPD:35
DH5L1AE-SAM	P Calc Info:										
Uncert	Level (#s).: 2	Decay	to SaDt: Y	Blk Subt.:	N Sci.Not.	: Y ODRs	: B				
DMN61AA-MBL	K:										•
Uncert	Level (#s).: 2	Decay	to SaDt: Y	Blk Subt.:	N Sci.Not.	: Y ODRs	: B				
DMN61AC-MLC	S:										
Uncert	Level (#s).: 2	Decay	to SaDt: Y	Blk Subt.:	N Sci.Not.	: Y ODRs	: B				

12/5/02 2:14:52 PM

# ICOC Fraction Transfer/Status Report ByDate: 8/25/02, 12/6/02, Batch: '2325530', User: \*All Order by BatchNbr, WorkOrderNbr, DateTimeAccepting

Q Batch Work Ord CurStatus		A	ccepting		Comments	
2325530			•			· · · · · · · · · · · · · · · · · · ·
AC	I	CalcC	BELSITOB	11/27/02 3:29:3	34 PM	
sc			WagarR	IsBatched	11/21/02 3:08:49 PM	ICOC_RADCALC v4.5.3.2
sc			BELSITOB	InPrep	11/27/02 3:29:34 PM	RICH-RC-5013 REVISION 4
sc			BELSITOB	InPrep	11/27/02 3:29:37 PM	RICH-RC-5017 REVISION 3
SC			BELSITOB	Prep1C	12/2/02 2:48:23 PM	RICH-RC-5013 REVISION 4
SC			BELSITOB	Prep1C	12/2/02 2:48:26 PM	RICH-RC-5017 REVISION 3
SC			DAWKINSO	InCnt1	12/2/02 4:33:23 PM	RICH-RD-0007 REVISION 3
SC			BlackCL	CalcC	12/5/02 10:24:58 AM	RICH-RD-0007 REVISION 3
AC			BELSITOB	11/27/02 3:29:3	37 PM	
AC			BELSITOB	12/2/02 2:48:23	3 PM	
AC			BELSITOB	12/2/02 2:48:26	S PM	
AC			DAWKINSO	12/2/02 4:33:23	3 PM	
AC			BlackCL	12/5/02 10:24:5	58 AM	

Page 1

AC: Accepting Entry; SC: Status Change

STL Richland Richland Wa.

12/3/02 9:20:39 AM		San	nple Prepara	Balance Id:1120373922						
127642, BECHTEL HANFORD, INC. Bechtel Hanford, Inc.		CH Sr-Total Prp TH Total Stront	RC5013, SepRC:	5006		Pipet #:				
Report Due: 12/11/2002		51 CLIENT: HA	•		PRIC	DIT	Sep1 DT/	Tm Tech: ルン/ノム	102 3:50 PM	
Batch: 2325531 SOIL	pCi/g		PM, Quote	BG1, 2703	B	<del>4111  </del>		Tm Tech:	. ,	
SEQ Batch, Test: None	-						Ť	rep Tech: ,WAG	NERJ	
Work Order, Lot,   Total   Sample DateTime   Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	QC Vial 2 Prep Date	Dish Size	Ppt or Geometry	Count Time Mir	Detector Id	Count On   C (24hr) Circle		
1 FDH5L-1-AC	6.02g,in	SRTA8222				~~	<b>O</b> 2	3.04	10/11/10	
J2K200322-1-SAMP		10/03/02 09/19/02.r			15.7	<u>50</u>	31/1	L 06/8	<u>6</u>	
11/20/2002 09:25	AmtRec: LP,	2X60G,20ML #	Containers: 4			s	cr Rst: Alpha	: 1.88E+01 p <sub>i</sub> Ci/g	Beta: 6.70E+01 pCi/g	
2 FDH59-1-AD	6.02g,in	SRTA8432					- 0		4	
J2K200322-2-SAMP		11/18/02 09/19/02.r	<u> </u>	· •	708		315		~	
11/20/2002 08:30	AmtRec: LP,	3X60G,20ML #	Containers: 5			s	cr Rst: Alpha	i: 9.47E+00 pCi/g	Beta: 2.39E+01 pCi/g	
3 FDH59-1-AN-X	6.0g,in	SRTA8442								
J2K200322-2-DUP		11/18/02 09/19/02.r			31.8		310	, 		
11/20/2002 08:30	AmtRec: LP,	3X60G,20ML #	Containers: 5			s	cr Rst: Alpha	n: 9.47E+00 pCi/g	Beta: 2.39E+01 pCi/g	
4 FDMPE-1-AA-B	6.0g,in	SRTA8452					<b>a</b> 3			
J2K210000-531-BLK		11/18/02 09/19/02.r			91.3		315	)		
11/20/2002 08:30	AmtRec:	#Containe	ers: 1			s	cr Rst:	Alpha:	Beta/	
5 FDMPE-1-AC-C	6.0g,in	STSB0649					_	2 X	A	
J2K210000-531-LCS		09/16/02 06/03/02.r			85,8		321		,	
11/20/2002 08:30	AmtRec:	#Containe	ers: 1			√ s	icr Rst:	Alpha:	Beta:	
Comments:										
all Clients for Batch: 127642, BECHTEL HANFORD, INC.		Bechtel	Hanford, Inc.	, B	G1, 27038	•••				
PDH5L1AC-SAMP Constituent List: Sr-90 RDL:1 pCi/g	LCL:70	UCL:130	RPD:35			·				
STL Richland Key: In - Initial Amt, fi - Richland Wa.	Final Amt, di - Dilu ec-Enrichment Cell,		1, s2 - Sep2	n 1					WO Cnt: 5 Prep_SamplePrep v4.	

12	/3/02	9:20:40	AM
14	13/02	3.20.40	AIVI

Report Due: 12/11/2002

Sample Preparation/Analysis PRIORITY

Balance	ld:1120373922
---------	---------------

CH Sr-Total PrpRC5013, SepRC5006 TH Total Strontium by GPC

**5I CLIENT: HANFORD** 

Blk Subt .: N

Sep1 DT/Tm Tech:

Pipet #: \_

Batch: 2325531

FDMPE1AC-LCS:

Uncert Level (#s).: 2

pCi/g

Decay to SaDt: Y

Sep2 DT/Tm Tech:

SEQ Batch, Test: None

Prep Tech: ,WAGNERJ

Work Order, Lot, Sample DateTime	Total Amt/Unit	71	al Aliquot nt/Unit	QC Tracer Prep Date	QC Vial 2 Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On   Off (24hr) Circle	CR Analyst, Init/Date
FDMPE1AA-BLK:								<u> </u>		· · · · · · · · · · · · · · · · · · ·	
Sr-90 RDL:1	pC:	L/g 1	LCL:	UCL:	RPD:						
FDMPELAC-LCS:											
Sr-90 RDL:1	pC:	i/g 1	LCL:70	UCL:130	RPD:35						
FDH5L1AC-SAMP Calc In	fo:										
Uncert Level (#s	).: 2 De	ecay to	SaDt: Y	Blk Subt.: 1	N Sci.Not	.: Y ODRs	: B				
FDMPE1AA-BLK:											
Uncert Level (#s	).: 2 De	cay to	SaDt: Y	Blk Subt.:	N Sci.Not	.: Y ODRS	: B				

ODRs: B

Sci.Not.: Y

WO Cnt: 5

42

12/11/02 2:12:41 PM

# ICOC Fraction Transfer/Status Report ByDate: 11/11/02, 12/12/02, Batch: '2325531', User: 'All Order by BatchNbr, WorkOrderNbr, DateTimeAccepting

Batch Work O	rd CurStatus	•	Accepting		Comments
2325531					
4C	CalcC	BELSITOB	11/27/02 3:29:5	54 PM	
SC		WagarA	IsBatched	11/21/02 3:08:49 PM	ICOC_RADCALC v4.5.3.2
5C		BELSITOB	InPrep	11/27/02 3:29:54 PM	RICH-RC-5013 REVISION 4
SC		BELSITOB	Prep1C	12/2/02 2:48:44 PM	RICH-RC-5013 REVISION 4
SC		WAGNERJ	InPrep2	12/3/02 8:54:41 AM	RICH-RC-5013 REVISION 4
SC		WAGNERJ	Prep2C	12/4/02 8:44:06 AM	RICH-RC-5013 REVISION 4
SC		FABREM	InSep1	12/4/02 3:29:50 PM	RICH-RC-5006 REVISION 4
SC		FABREM	Sep1C	12/10/02 7:03:49 PM	RICH-RC-5006 REVISION 4
SC		DAWKINSO	InCnt1	12/10/02 10:41:44 PM	RICH-RD-0003 REVISION 3
SC .		BlackCL	CalcC	12/11/02 10:38:50 AM	RICH-RD-0003 REVISION 3
IC .		BELSITOB	12/2/02 2:48:44	I PM	
AC .		WAGNERJ	12/3/02 8:54:4:	I AM	
AC .		WAGNERJ	12/4/02 8:44:06	S AM	
AC .		FABREM	12/4/02 3:29:50	) PM	
AC .		FABREM	12/10/02 7:03:4	19 PM	
IC .		DAWKINSO	12/10/02 10:41	:44 PM	
4 <i>C</i>		BlackCL	12/11/02 10:38	:50	

11/21/2002 3:08:59 127642, BECHTEL F Bechtel Hanford, Inc. Report Due: 12/11	IANFORD, INC.		Sample Preparation/Analysis  DW Alkaline Digestion by method 3060A  EA Chromium, Hexavalent (7196A)  5I CLIENT: HANFORD  PRIORITY								lance ld: Pipet #: Tm Tech:	
Batch: 2325532	SOIL	mg/kg			PM, Quote: i	BG1, 27				-	Tm Tech:	
SEQ Batch, Test: None		0 0								·	ep Tech:	
Work Order, Lot, Sample DateTime	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date		QC Vial 2 Prep Date	Dish Size		Ppt or Geometry	Count Time Min	Detector Id	Count On   Off (24hr) Circle	CR Analyst, Init/Date
1 FDH5L-1-AA J2K200322-1-SAMP							- '	-			"	
11/20/2002 09:25		AmtR	ec: LP,2X60G,20M	L	#Containers: 4			Scr Rst:	Alp	oha:	Beta:	
2 FDH5L-1-AF-S		· •										
J2K200322-1-MS		**			·····							
11/20/2002 09:25		AmtR	ec: LP,2X60G,20M	L	#Containers: 4			Scr Rst:	Alp	ha:	Beta:	
3 FDH5L-1-AG-X												·
J2K200322-1-DUP	· · · · · · · · · · · · · · · · · · ·											
11/20/2002 09:25		AmtR	ec: LP,2X60G,20M	L	#Containers: 4			Scr Rst:	Alp	eha:	Beta:	
4 FDH5L-1-AH-S									·			
J2K200322-1-MS												
11/20/2002 09:25		AmtR	ec: LP,2X60G,20MI	L	#Containers: 4			Scr Rst:	Alp	ha:	Beta:	
5 FDH59-1-AA							-				•	·
J2K200322-2-SAMP								*****************				
11/20/2002 08:30		AmtR	ec: LP,3X60G,20Ml	L	#Containers: 5			Scr Rst:	Alp	ha:	Beta:	
6 FDMPN-1-AA-B											<del></del>	
J2K210000-532-BLK												
11/20/2002 09:25		AmtRo	<b>ec:</b> :	#Contai	ners: 1			Scr Rst:	Alp	ha:	Beta:	
7 FDMPN-1-AC-C												
J2K210000-532-LCS					4							
11/20/2002 09:25		AmtRo	e <b>c:</b> 1	#Contair	ners: 1			Scr Rst:	Alp	ha:	Beta:	
STL Richland	Key In - Initial Amt	, fi - Final Amt, di - D	iluted Amt		· · · · · · · · · · · · · · · · · · ·	-			<del></del>	· · · · · · · · · · · · · · · · ·		WO Cnt: 7
Richland Wa.	•	date, ec-Enrichment Ce		Added	Page 1							ICOC v4.5.3

11/21/2002 3:08:59 PM			Sam	ple Preparation	n/Analy	Bala	ance ld:	* ***			
					exavalent (7196A)		PRI(	ORITY			
Report Due: 12/11/2002				51 CLIENT: HAN	FORD				Sep1 DT/T	m Tech:	
Batch: 2325532			mg/kg						Sep2 DT/T	m Tech:	
SEQ Batch, Test: Nor	ne								Pre	p Tech:	
Work Order, Lot, Sample DateTime	Total Amt/Ur	nit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	QC Vial 2 Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On   Off (24hr) Circle	CR Analyst, Init/Date
Comments:		_	""		······································	·				<u>'                                      </u>	
all Clients for Barrier 127642, BECHT		INC.		Bechtel H	anford, Inc.	, B(	31, 27038				
DH5L1AA-SAMP Con	stituent Li	st:									
DH5L1AF-MS Const	ituent List	::			•						
'DH5L1AH-MS:			,								
DMPN1AA-BLK:											
DMPN1AC-LCS:											
DH5L1AA-SAMP Calo	c Info:										
Uncert Level DH5L1AF-MS Calc 3		Decay	to SaDt: Y	Blk Subt.: N	Sci.Not.: Y	ODRs:	В				
Uncert Level		Decay	to SaDt: Y	Blk Subt.: N	Sci.Not.: Y	ODRs:	В				
Uncert Level	(#s).: 2	Decay	to SaDt: Y	Blk Subt.: N	Sci.Not.: Y	ODRs:	В				
Uncert Level	(#s).: 2	Decay	to SaDt: Y	Blk Subt.: N	Sci.Not.: Y	ODRs:	В				
DMPN1AC-LCS: Uncert Level	(#s).: 2	Decay	to SaDt: Y	Blk Subt.: N	Sci.Not.: Y	ODRs:	В				

STL Richland Richland Wa. Key: In - Initial Amt, fi - Final Amt, di - Diluted Amt,

r - Reference date, ec-Enrichment Cell, ct-Cocktailed Added

Page 2

WO Cnt: 7 ICOC v4.5.3.2 12/13/02 12:54:36 PM

## M ICOC Fraction Transfer/Status Report ByDate: 11/13/02, 12/14/02, Batch: '2325532', User: \*All Order by BatchNbr,WorkOrderNbr,DateTimeAccepting

Q Batch Wor	rk Ord CurStat	us A	Accepting		Comments	
2325532						
AC	Sep2C	ManisD	12/4/02 9:00:55	á AM		
SC		WagarR	IsBatched	11/21/02 3:08:49 PM	ICOC_RADCALC v4.5.3.2	
SC		ManisD	Sep1C	12/4/02 9:00:55 AM	RICHWC5005 REV6	
SC		ManisD	Sep2C	12/4/02 3:30:40 PM	RICHWC5005 REV6	
SC		OConnellD	Rev2C	12/13/02 12:53:09 PM	RICHWC5005 REV6	
SC		ManisD	Rev1C	12/13/02 3:30:20 PM	RICHWC5005 REV6	
AC		ManisD	12/4/02 3:30:40	) PM		
AC		OConnellD	12/13/02 12:53:	:09 PM		
AC		ManisD	12/13/02 3:30:2	20 PM		

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AC: Accepting Entry; SC: Status Change

STL Richland

Richland Wa.

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